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REVIEW

OF

FOREST ADMINISTRATION

IN

BRITISH INDIA

FOR THE YEAR

1892-93.

(Period of fifteen months ending 30th June 1893.)

BY

B. RIBBENTROP, C.I.E.,
INSPECTOR GENERAL OF FORESTS TO THE GOVERNMENT OF INDIA.

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REVIEW

OF

FOREST ADMINISTRATION IN BRITISH INDIA

FOR THE YEAR 1892-93.

CHAPTER I.

EXTENSION AND ORGANIZATION OF THE FOREST AREA.

I.—ALTERATIONS OF AREA.

During the 15 months, ending with the 31st June 1893, the gross area of reserved forests was increased from 59,743 to 66,865 square miles. The changes which took place are summarized in the following table and are dealt with in greater detail under each province:—

Table No. I.

Province.	In 1891-92.	Added in 1892-93.	Excluded in 1892-93.	At the close of the year 1892-93.	REMARKS.
Bengal	5,211	(a) 536	(b) 44	5,703	
North-Western Provinces and Oudh	3,768	(c) 11	(d) 36	3,743	
Punjab	1,715	(e) 96	(f) 65	1,746	
Central Provinces	19,680	549	606	19,623	
Burma (Lower)	5,615	180	5	5,790	(a) 525 square miles obtained by rectification of previous area figures.
Burma (Upper)	1,059	1,210	...	2,269	
Assam	3,612	14	...	3,626	(b) 8 square miles due to rectification of previous area figures.
Coorg	113	1	...	114	
Ajmere	139	...	...	139	(c) 3 square miles obtained by rectification of previous area figures.
Baluchistan	82	25	1	106	
Andamans	...	24	...	24	(d) 34 square miles due to rectification of previous area figures.
TOTAL	40,994	2,646	757	42,883	
Berar	1,256	2,992	12	4,236	(e) 3 square miles obtained by correction of previous area figures.
TOTAL BENGAL PRESIDENCY	42,250	5,638	769	47,119	(f) 6 square miles due to correction of previous area figures.
Madras	7,175	2,441	180	9,436	
Bombay	10,318	47	55	10,310	
GRAND TOTAL	59,743	8,126	1,004	66,865	

The above table is of importance in showing the progress which has been made in the final constitution of State forest property. The areas which, in addition to the reserved forests, were, at the end of the year 1892-93, under the control of the Forest Department, are shown in the summary contained in Table No. II. In the latter table the areas to which a general protection of forest and forest-produce was accorded under forest laws which do not recognize

the class of protected forests, have nevertheless, for the sake of convenience, been entered under this head in preference to the head "unclassed forests."

Table No. II.

Province.		Forest area in square miles.				Percentage of forests to whole area of province.	Percentage of reserves to whole area of province.	Remarks.
Name.	Area in square miles.	Reserved.	Protected.	Unclassed.	Total.			
Bengal . .	150,727	5,703	3,071	4,034	12,808	8·5	3·8	(a) Includes 78 square miles of *leased* forests.
North-Western Provinces and Oudh.	107,441	(a)3,743	94	49	3,886	3·61	3·5	(b) Includes 341 square miles of *leased* forests and 112 square miles of "military reserves."
Punjab . .	106,613	(b)1,746	(c)199	(d)4,107	6,052	5·5	1·5	(c) Includes 131 square miles called "civil protected forests."
Central Provinces .	86,501	19,623	...	391	20,014	23·0	22·7	(d) Includes 224 square miles of *leased* forests.
Burma (Lower) .	87,220	(e)5,790	...	...	(e)5,790	6·5	6·5	(e) Includes 456 square miles of *taungya* areas.
Burma (Upper) .	77,296	(f)2,269	24,740	...	27,009	35·0	3·	(f) Includes 196 square miles of *taungya* areas.
Assam . . .	45,350	3,626	...	7,140	10,766	24·0	8·	(g) Village lands managed by the department, but not yet brought under the Ajmere Forest Regulation.
Coorg . . .	1,583	114	779	...	893	56·0	7·	(h) Includes 154 square miles of *leased* forests.
Ajmere . .	2,711	139	...	(g)8	147	5·42	5·	(i) Includes the area of the leased forests in the Dangs, which is given as 679 square miles.
Baluchistan . .	...	106	...	...	106	...	...	(j) Baluchistan left out of account.
Andamans . .	1,989	24	...	1,932	1,956	98·0	1·	(k) Includes 4 square miles in the Shah Ghardhandan forest in the Sehwan Taluka, which was omitted by the Deputy Conservator of Forests from former reports through an oversight.
Total .	667,431	42,883	28,883	17,651	89,427	(j)13·4	6·4	* In last year's Report the area shewn under "protected" should have been entered as "unclassed" forest.
Berar . . .	17,711	4,236	...	...	4,236	24·	24·	
Total Bengal Presidency.	685,142	47,119	28,883	17,661	93,663	(j)13·6	7·	
Madras . .	86,380	9,436	*	(k)7,751	17,187	20·	11·	
Bombay . .	124,352	(i)10,310	(k)4,200	...	(i)14,510	11·6	8·	
GRAND TOTAL .	895,874	66,865	33,083	25,412	125,360	(j)14·	7·5	

Tables I and II, especially the columns showing the percentage of areas in which the extent of the dominion of the State and of private right has been finally settled, and to which the Government has laid, so to say, a preliminary claim by declaring them either protected or by placing them under the control of the Forest Department as forests still unclassed, are interesting in so far as they show the development of forest administration.

They give, however, no clear idea of the distribution of the areas taken under the control of the State, nor of the sufficiency or insufficiency of the forests for local or general wants. It is, moreover, impossible to gauge from these tabular statements the fiscal value or the general or local importance of the State forest property in any particular area or province.

The distribution of the areas under the provisions of the Forest Laws in India is, no doubt, indicated in the maps quinquennially published by the Forest Survey Branch; but it has been found impossible, for want of information, to exhibit on these maps the character of the vegetation surrounding the State forest property already constituted, and without this knowledge it is not feasible to lay down a detailed policy for the future. The policy must depend entirely on local conditions and must be ruled by them. I have dealt with this question in paragraph 2 of my Review for 1891-92; but the subject is in my opinion of sufficient importance to warrant a repetition of the main principles as understood by me.

The material progress of the country, in its agricultural and general development, must be the chief aim of forest conservancy. The first consequence of this thesis is that lands, which are by nature suitable for permanent and self-supporting cultivation, or which can be adapted to this purpose by irrigation, should not, as a rule, be included within the boundaries of reserves. I even maintain that, where this has been done to a considerable extent, it may often become advisable to reconsider the inclusion of such areas in case a demand for agricultural land arises and the tracts in question are of sufficient extent and importance. I have advisedly used the words "permanent and self-supporting cultivation;" for no permanent benefit can be rendered to the country by relinquishing to cultivation areas, the surface-soil of which is liable to be washed away, or is subject to such deterioration as renders it unfit for further cultivation until it has again lain fallow for many years under jungle or forest growth; nor can the material advantage of the State be served by the creation of semi-pastoral villages with an insufficiency of culturable land.

Considerable tracts exist in India which should doubtless be primarily used as grazing grounds, and which no amount of protection will ever transform into a tree-forest. These areas should be used for the purpose for which nature has intended them; but the certainty of such intention should be based on local enquiry, as large areas exist which, under the direct influence of man, have deteriorated into barren wastes, and which would yield more and better produce, be it grass or be it wood, under a conservative treatment.

The protection of forests occupying hill slopes is in every way of great climatic, protective and economic importance in the agricultural and general advancement of the country; and even in the plains the creation or maintenance of forests may be of permanent economic value. Considerable progress has been made in this direction wherever land was at the disposal of Government; but this has not everywhere been the case, and the existing forest laws are impractical in regard to the creation of village forests, their settlement or the settlement of private forests, and the protection of all classes of forest not included in the reserved or protected categories.

Hence the promulgation of new laws may become advisable and may have useful results, even should the Government not provide for State interference with the management of commercial and private forests.

Bengal.—The recorded reserved area, at the close of the period of fifteen months ending 30th June 1893, amounted to 5,703 square miles, as compared with 5,211 square miles in the preceding year. This increase was due mainly to recomputations in the Sundarbans, where about 500 square miles of water-channels were, for the first time, included in the area statement. Apart from recomputations, the reserved area was reduced by ·25 square miles. The most noteworthy increase of area controlled by the Forest Department was caused by the issue of orders declaring all State lands in the five districts of Chota Nagpur to be protected forests under Capter IV of the Forest Act. The area so protected in the Singbhum district is 500 square miles; and this, together with 6 square miles in Puri, constituted the real additions to the protected forests. In the Sundarbans, a nominal increase of 384 square miles was recorded, and the total extent of protected forest at the close of the year, exclusive however of the State forests in Chota Nagpur outside the Singbhum district, the extent of which is unknown, was 3,071 square miles. The unclassed forests were reduced in Singbhum by 500 square miles, transferred to the protected category, and now extend to 4,034 square miles. Thus the total area of forests of all classes on the books of the Department amounted to 12,808 square miles, or to 8·5 per cent. of the entire provincial area. The validity of the inclusion of large water-covered areas in the Sundarbans, as reserved or protected forest under the Act is perhaps questionable. But, as such inclusion does not affect the

power of Government in controlling forest-produce during transit by water, the matter does not appear to be of much importance.

North-Western Provinces and Oudh.—Except as concerns rectification of previous figures, the recorded changes of reserved area were unimportant. The total extent of this class of forest, at the close of the year, was 3,743 square miles, or 25 square miles less than for 1891-92. In Oudh, the area of the forests is not accurately known, but the information will soon become available, when the forest survey, now in progress, is completed. The protected forests are confined to about 90 square miles in the Banda district, and these it is proposed to constitute reserves. The extent of the unclassed areas remained almost unchanged. The total area, controlled by the Department at the close of the period, amounted to 3,886 square miles or to 3·61 per cent. of the total provincial area.

Punjab.—In this Province, also, the changes in forest area were unimportant. At the close of the period, the gross area of all classes of forest, controlled by the Department, amounted to 6,052 square miles, or 18 square miles less than for the year 1891-92. The reserved forests were diminished by 62 square miles, mainly in order to meet requirements for colonization in the *bár* lands of the Gujranwala district, and increased by 93 square miles for military purposes, the net addition being 31 square miles. The policy of the Military Department is to bring all forest controlled by it under the provisions of Chapter II of the Forest Act. Two hundred and eighty-two square miles were removed from the protected area under the Forest Department for the Gujranwala colony, but 216 square miles of unclassed forests were transferred during the year from the charge of the revenue staff to that of the forest officials. With reference to the remarks on the subject contained in the Review for 1891-92, it was decided to retain, for the present at least, the unclassed forests in the *bár* of the Montgomery district in the charge of the Deputy Commissioner. It may be noted that the only protected forests under the Forest Department in the Province are those lying in the *bár* tracts of this District.

Central Provinces.—No material change took place in the constitution or extent of the forests. At the close of the period under notice the aggregate area of reserved forests amounted to 19,623 square miles, as compared with the previously reported area of 19,680 square miles. In connection with the ultimate classification of the forests, the following table is here reproduced from the orders of the Chief Commissioner on the work of the year. The forests are at present classified under (A)—forests strictly conserved, (B.I.)—areas available for cultivation, and (B.II.)—areas remaining to be classed in the two preceding categories. The areas are indicated in square miles :—

Circle.	31st March 1892.				30th June 1893.			
	A.	B. I.	B. II.	Total.	A.	B. I.	B. II.	Total.
Northern	3,945	656	5,478	10,079	3,968	657	5,478	10,103
Southern	5,244	9	4,348	9,601	5,118	331	4,071	9,520

The statement indicates that the final repartition of areas between the A and B. I. categories had not much progressed. The Chief Commissioner remarked upon the importance of an early classification of the B. II. areas, and the consideration of this question, as regards the Northern Circle, was to be in an advanced stage. The excision of culturable areas in that circle was also reported as nearly complete. Fuller information on this important question, pending the solution of which organized forest administration in these provinces must be hampered, will probably be available for incorporation in the Review for 1893-94.

Burma.—At the close of the period under notice the total area of reserved forest in *Lower Burma* was 5,790 square miles, of which 456 square miles were burdened with *taungya* privileges. The addition during the period to this class of forest was 169 square miles, of which 103 square miles are in the Pegu Circle. Enquiries with a view to extensive further reservations in the Western and Shwegyin Divisions were made, and the areas in question were declared reserved after the close of the period reported upon.

In *Upper Burma* six new forests, aggregating 627 square miles (one of 36 square miles in Bhamo and five of 591 square miles in Katha), were reserved, thus increasing the total area of this class in the Eastern Circle to 1,447 square miles. The reserved area

in the Western Circle amounts to 822 square miles, of which 583 were added in the Upper Chindwin and Minbu Divisions. During the year the Upper Burma forest circle was subdivided into two, the Eastern and Western, with head-quarters in each case at Mandalay. Taking the province as a whole, the total area of reserved forests at the close of the year was 7,407 square miles with, in addition, 652 square miles of Karen areas. The large area, 1,307 square miles, reserved during the year, is evidence of the commendable activity displayed in organizing the State forest property.

Assam.—The area of reserved forests was increased by 14 square miles in the Goalpara and Sibsagar Districts, and amounted at the close of the year to 3,626 square miles. The introduction on the 1st April 1892 of the Assam Forest Regulation, which takes no account of protected forests, necessitated the abolition of that class. The unclassed forests received a net actual addition of 907 square miles, including the areas formerly known as "protected forest," and 798 square miles were added by recomputation of pre-existing forests areas. The total extent of reserved and unclassed forests controlled by the department, on the 30th June 1893, was 10,766 square miles or 24 per cent. of the gross area of the province.

Coorg.—The changes of area were altogether unimportant. The 134 square miles of forest, alluded to in the last Review as placed temporarily in the protected category, underwent no change during the year, but their constitution as reserves in 1893-94 was anticipated. The total area of forest of all classes was 893 square miles, as compared with 855 square miles in the previous year.

Ajmere.—The area of the reserves administered by the Forest Department underwent practically no change. The new Regulation, for the protection of woods and pastures not belonging to the State, was introduced on the 1st April 1892, but there was no change in the area of Village Reserves. Efforts made to create such reserves fell through owing to local opposition; but proposals for other reservations were under consideration.

Andamans.—No alteration in the gross area of the forests occurred, but 4 tracts in the vicinity of Port Blair were selected and declared "reserved," not under any legal enactment, but by executive order. In this way was initiated the policy, suggested by the Inspector General of Forests, of formally demarcating and reserving all forests which it is intended permanently to maintain and exploit as such.

Baluchistan.—The addition made to the area of reserved forests, if small, was larger than that of the previous year. The Thalli reserve, of 25 square miles, was constituted, and the total reserved area amounted to 106 square miles.

Berar.—The forests were diminished by 200 square miles, and their total area was 4,236 square miles, or 24 per cent. of the provincial area, as follows:—

	Square miles.
Class A.– For timber and fuel	1,323
„ B.—For fodder and high grass	64
„ C.—For pasture	1,599
„ D.—Temporary (pending further classification)	1,250

Of the fourth category, it is anticipated that about 250 square miles will be made available for cultivation, leaving 1,000 for timber or pasture. Some 4,000 square miles in all will thus be maintained under forest. The repartition of forests of class "D" has advanced far towards completion. In connection with the classification of the forests an important step was taken by the issue, in June 1892, of rules under the Forest Law of 1886, for the constitution and management of the various classes according to the purpose of each class. The rules have placed the forest policy to be pursued in Berar on an intelligible and well-defined footing.

Madras.—The following table is extracted from the orders of the Local Government on the Administration Report for the year:—

	Area on 1st April 1892.	Added in 15 months ending 30th June 1893.	Excluded during this period.	Area on 30th June 1893	Increase or Decrease.
Reserved forests	7,175	2,441	180	9,436	+2,261
Do. lands	9,404	1,075	2,728	7,751	−1,653
	16,579	3,516	2,908	17,187	+608

The total area controlled by the Forest Department was 17,187 square miles, or about one-third of the total land at the disposal of Government. Future selections, with a view to the constitution of reserves, are estimated to extend to nearly 6,000 square miles in addition to the areas given in the above table.

Bombay.—The total forest area of all classes at the conclusion of the period was 13,831 square miles, as compared with 13,810 square miles, previously reported. The area of reserved forests was increased by 22 square miles in the Panch Mahals. For the Central Circle some variations of area are recorded, but elsewhere the alterations were unimportant and need not be further alluded to.

II.—Forest Settlements.

The Table below, No. III, shows the alterations which took place in the area under the control of the Forest Department during the 15 months under review.

There was, in the area of reserved forests, a net increase of 7,122 square miles, which, to a great extent, is due to the transfer from protected and unclassed forests of areas in which the rights of Government and of private persons had been sufficiently settled.

The figures indicating decrease are due to boundary corrections and disforestments under the sanction of the Government of India.

The changes which took place under classes (B) and (C) were caused partly by transfers to class (A) and partly by new areas having been taken up as a preliminary to final settlement. These latter areas will ultimately be either transferred to reserved forests or be abandoned as unsuitable for permanent conservancy, or as better fitted for cultivation or other purposes.

Table No. III.

Province.	ALTERATIONS IN AREA, IN SQUARE MILES, DURING 1892-93.								Remarks.
	(A) Reserved Forests.		(B) Protected Forests.		(C) Unclassed State Forests.		Total.		
	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.	
Bengal	(a) 536	(b) 44	890	...	...	500	1,426	544	(a) 525 square miles obtained by rectification of previous area figures.
North-Western Provinces and Oudh.	(c) 11	(e) 36	...	...	(d) 3	8	14	44	(b) 8 square miles due to rectification of previous area figures.
Punjab	(f) 96	(g) 65	...	282	(h) 243	(i) 10	339	357	(c) 3 square miles obtained by rectification of previous area figures
Central Provinces	549	606	...	...	3	5	552	611	(d) Obtained by rectification of previous area figures.
Burma (Lower)	(o) 180	(j) 5	...	...	...	...	180	5	(e) 34 square miles due to rectification of previous area figures.
Burma (Upper)	(k) 1,210	...	12,143	3,864	...	...	13,353	3,864	(f) 3 square miles obtained by correction of previous area figures.
Assam	14	...	...	912	1,778	73	1,792	985	(g) 6 square miles due to correction of previous area figures and river action.
Coorg	1	...	39	2	...	...	40	2	(h) 5 square miles obtained by correction of previous area figures and river action.
Ajmere	...	...	...	...	...	...	...	...	(i) 7 square miles due to correction of previous area figures and river action.
Baluchistan	25	1	...	...	...	...	25	1	(j) *Taungya* area.
Andamans	24	...	...	...	...	25	24	25	(k) 83 square miles *taungya* area.
Net Total Increase or Decrease.	2,646	757	13,072	5,060	2,027	621	17,745	6,438	(l) Due to rectification of previous area figures.
Berar	2,992	12	565	1,570	2	2,177	3,559	3,759	(m) 117 square miles obtained by rectification of previous area figures.
Net Total, Increase or Decrease, Bengal Presidency.	5,638	769	13,637	6,630	2,029	2,798	21,304	10,197	(n) 33 square miles due to rectification of previous area figures. Also includes 1,304 square miles shewn in last year's Report which should have been excluded.
Madras	2,441	(l) 180	...	...	(m) 1,075	(n) 4,032	3,516	4,212	(o) 11 square miles obtained by rectification of previous area figures.
Bombay	44	52	1	10	...	...	45	62	
Grand (Net) Total, Increase or Decrease.	8,123	1,001	13,638	6,640	3,104	6,830	24,865	14,471	

Bengal.—A very important step in the direction of settlement was the constitution of protected forests in the districts of Chota Nagpur, and rules for the management of these tracts were under consideration at the close of the year. Of reserved forests, only 10 square miles were constituted, but 332 square miles were under settlement, and it was in contemplation to notify as proposed reserves important tracts in Chittagong. Gradual effect is being given to the policy of reserving all important areas which it has been decided to maintain permanently under forest. The boundary re-alignment of the Angul forests, which was undertaken in connection with the scarcity prevailing in that locality, was concluded, and 29 square miles, previously included in the area of protected forests, was removed from the operation of the Act. On the general policy to be pursued in respect of fuel and fodder reserves in Bengal, the result of the enquiries made tends to show that such reserves are not needed as much in the Lower Provinces as elsewhere, owing to the moist climate and to the abundant pasture thereby generated. The question, however, is considered to demand careful consideration, and instructions were issued during the year with the view to the selection of reserves in Jalpaiguri and Chittagong.

North-Western Provinces and Oudh.—The attention paid locally to this important subject, referred to in the Review for 1891-92, was maintained during the year, and is an especially satisfactory feature of the administration reports. Settlement work proceeded in all the circles. In the *Central Circle* the reservation of forest areas, which it is proposed to set apart for the wood-supply of Almora, as well as of tracts containing *Acacia catechu* in the Kumaon Bhabar, was in progress, and the provisions of Chapter IV of the Forest Act were applied to the unmeasured lands of the hilly districts of Kumaon. In the *School Circle* the constitution and boundaries of the reserved forests of Jaunsar were under consideration, and in *Oudh* similar matters, tending to the consolidation of the reserves, were undergoing settlement. Generally efforts were made to remedy, where it was still possible to do so, past errors in forest settlements. As remarked in the orders of the Local Government on the administration reports, "acting on the advice of the Inspector General of Forests, His Honour the Lieutenant-Governor has reviewed all previous settlements and passed such orders as seemed called for with a view to placing the reserves on an unassailable legal basis." The application of these orders will be set forth in future reports. Their effect will probably be most markedly beneficient in the Oudh reserves, and their general tendency will inevitably be to enhance the economic and capital value of the State forest property.

Punjab.—No important settlements were sanctioned during the year, though some minor operations were in progress, principally in connection with land-revenue settlements. The settlements of the Kangra and Kulu forests, as well as of areas in Gujrat and in the Chamba State, remained under the consideration of the Local Government. Since the close of the period under review preliminary orders have been passed on the Kangra and Kulu settlements, which have been pending longer than any other forest settlement in India.

Central Provinces.—Forest Settlement work in these provinces was continued on the lines mentioned in the Review for 1891-92, and the classification of the forests, at the close of the year under notice, has been alluded to in the previous section. As in 1891-92, little was reported as having been done in the Southern Circle, but in the Northern Circle the selection of areas for the extension of agriculture is more advanced. The settlement as to what areas shall be permanently maintained as forest is urgent in connection with working-plans and the improvement of forest organization generally. On this point the Chief Commissioner remarked, "the question of excision should be finally disposed of, so as to allow the Department to devote all its energies to the area intended to be permanently reserved."

Burma.—Progress in forest settlements was satisfactory, and it is intended to make considerable additions to the areas of reserves in Upper Burma and in the Pegu Circle. The formation of Karen areas, as an integral portion of the reserves, is approved by the Local Government, and is reported to have fulfilled, for upwards of 16 years, the advantages claimed when the scheme was introduced in 1877. The system has been extended to Upper Burma, and facilitates the extinction of the *taungya* method of temporary cultivation, which affects the most valuable area in the heart of the forests. The suppression of *taungyà* methods is now compensated for by the grant of lands fit for permanent cultivation, and by liberal advances for the purchase of cattle and other agricultural requirements. In Upper Burma, the large amount of settlement work done hindered progress in the further exploration of the more valuable forests. Nevertheless,

the area temporarily "protected" under the Upper Burma Regulation was, at the end of the period under review, 24,740 square miles. The forests are rightly taken up tentatively after preliminary examination and are, upon subsequent and more thorough enquiry, either constituted reserves, or thrown out as useless or better adapted for agricultural purposes. During the 15 months under notice, 12,143 square miles were thus added, and 3,864 square miles were either reserved, or abandoned as unsuitable for forest purposes. In Upper Burma, the development of the material resources of the country occasions a gradually more intensive application of the powers acquired under the Forest Regulation. In this way, a revised edition of forest rules was promulgated and extended to parts of the country hitherto exempted, and royalty on timber exported for trade purposes was enhanced. In reviewing progress, the Government of India intimated approval of these and of other measures.

Assam.—In passing orders on the administration report for the year, the Government of India remarked that the progress in the constitution of reserved forests was slow. Of 333 square miles, under settlement at the commencement of the period, only 14 miles were declared reserved; but 616 square miles of forest were notified for reservation during the year. The total area, therefore, in process of settlement at the close of the period, amounted to 936 square miles, of which 510 square miles were formerly included in the protected category. Orders were issued to push on settlement operations.

Coorg.—The forest report omits to record under this head what settlements were in progress. Steps were being taken to constitute as reserves the 86,000 acres of forests in the Ghats, temporarily classed as protected.

Ajmere.—There is little to record under this head. Regulation I of 1892, for affording assistance of Government in the conservation of forests not the property of the State, was introduced. No progress was effected in the constitution of Village Reserves, but efforts in this direction were made. The proposed village reservation of 6,000 acres, referred to in the Review for 1891-92, was abandoned owing to popular opposition.

Andamans.—A commencement was made in the selection and formal reservation of the more important forests, as noted in the previous section and in the Review for 1891 92, page 8.

Baluchistan.—The progress reported in the final constitution of State forests, and in the selection and settlement of lands previous to reservation, continued to be slow and unsatisfactory. The only tract declared to be a State forest during the period was the Thalli reserve of 25 square miles. The Zarghun tract, referred to in previous reviews, has been awaiting reservation since 1892, and proposals for reserving other forests were under consideration during the year. The question of the extent to which the provisions of the Forest Law can be locally applied in the constitution of State forests has not been sufficiently alluded to in recent administration reports, and the Government of India requested that, in the report for 1893-94, "this subject may be comprehensively discussed, and that the extent and position of existing State forests, as well as of other areas which may be deemed suitable for reservation, be indicated on a map."

Berar.—The repartition of the forests among the four classes, according to the purpose served or intended to be served in each case, has been indicated in the preceding section under "Area." The final distribution of the forests, temporarily classed as D, has advanced far towards completion, and is being actively carried on. These D forests comprised, at the end of the period under notice, 918, 46 and 286 square miles in the districts respectively of Ellichpur, Wun and Basim.

Madras.—The activity displayed during recent years in the constitution of forest estates under the Madras Forest Act was fully maintained, and indeed the work done exceeded that of any previous year. Immense additions, aggregating 2,441 square miles, were made to the area of finally settled reserves. It is in contemplation to settle further areas totalling some 6,000 square miles, which will bring the extent of reserved forest to about 40 per cent. of the area of unoccupied waste. Progress in forest settlement is altogether satisfactory in Madras, and, if Burma be neglected, quite exceptional. During the three years, 1890 to 1893, the areas notified under section 16 of Act V of 1882 have steadily increased, and during the 15 months under notice 2,261 square miles were reserved. Notwithstanding the increased area brought under settlement in 1892-93, the proportion of unsettled to settled forest was reduced. Out of a total extent of 6,082 square miles of forest undergoing settlement, the proceedings in respect of 735 square miles were practically finished, and those regarding 3,722 square miles were far advanced towards completion. Not merely the quantity, but especially the quality of

the settlement work done, can be favourably compared with results obtained in other provinces.

Bombay.—In the *Central Circle* good progress was made in completing the settlement of the provisionally notified forests. No further proceedings, in respect of lands reserved under section 34 of the Act, are necessary in this circle. In the *Southern Circle* the outturn of work for the year was satisfactory, but a large area in Kanara remains for settlement. In the *Northern Circle*, where 364 square miles were settled during the year, good progress was made, especially in the Panch Mahals and in the Thana forests. In *Sind*, a special forest settlement staff was appointed in November 1892, in order to augment the area of the reserves, so as to provide for the increasing consumption of fuel. The work done was not reported.

III.—DEMARCATION.

I can claim no great degree of accuracy for the following table, compiled for the Bengal Presidency from the available information. But the statement is nevertheless useful; as it gives an idea of the magnitude of the question, and proves that the importance of the subject is fully understood, and that laudable activity has been and is displayed in securing permanent and reliable boundaries.

Division. (1)	Length of boundaries artificially demarcated during the year. (2)	Length of previously existing boundaries repaired. (3)	Length of previously existing boundaries not repaired. (4)	Total length of artificially marked boundaries at the close of the year. (5)	Length of boundaries not demarcated at close of year. (6)	Length of natural boundaries not requiring artificial marks. (7)	Total length of boundaries at the close of the year. (8)	Expenditure on demarcation during the year. On new work. (9)	On repairs. (10)	Remarks. (11)
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles	R	R	
Bengal Circle	36	2,028	57	2,121	...	1,436	3,557	358	7,592	
North-Western Provinces and Oudh — Central Circle	146	408	1,855	2,409	3	389	2,801	936	1,242	
North-Western Provinces and Oudh — Oudh "	...	131	982	1,113	...	321	1,434	9,356	1,559	The figures for Oudh are not trustworthy. They are estimated and must so remain until the forest survey is complete.
North-Western Provinces and Oudh — School "	37	289	155	481	167	313	961	2,446	979	
Punjab Circle	73	1,500	6,719	8,292	4,621	1,114	14,027	1,736	1,626	
Central Provinces — Southern Circle	213	10,027	374	10,614	441	1,008	12,063	847	3,502	
Central Provinces — Northern "	177	8,970	833	9,980	10	1,065	11,055	2,613	2,945	
Lower Burma — Tenasserim Circle	56	--	587	643	32	411	1,086	588	369	
Lower Burma — Pegu "	64	536	1,371	1,971	52	867	2,890	1,417	2,008	
Upper Burma — Eastern Circle	295	...	231	526	312	25	863	4,642	...	
Upper Burma — Western "	13	...	...	13	418	260	691	2,674	...	
Assam Circle	22	1,120	44	1,186	...	1,193	2,379	83	3,187	
Coorg "	71	337	209	617	...	29	646	1,176	550	
Ajmere "	...	6	177	183	...	158	341	...	117	
Andamans "	...	...	...		...	...	...	...	...	Form No. 48 not furnished.
Baluchistan "	3	9	149	161	3	45	209	15	29	
Berar "	66	334	471	871	10	130	1,011	807	426	
TOTAL	1,272	25,695	14,214	41,181	6,069	8,764	56,014	29,694	26,131	

N.B.—Boundaries include, besides the outer perimeter, the limits of enclosures of private or other lands within the forests, but not the limits of sub-divisions such as blocks, compartments and coupes.

The table will be revised from year to year and will soon, it is hoped, form a reliable record. I have not been able to compile a similar table for the Madras

and Bombay Presidencies; but that the subject receives due consideration in those provinces may be gathered from the special paragraphs dealing with it in the provincial notices.

Bengal.—The total length of reserved forest boundaries, at the close of the period, was reported as 3,557 miles, of which 1,436 are natural land-marks. New artificial boundary work extended to 36 miles and 2,028, out of a possible length of 2,085 miles, were repaired. The revised boundaries of the Angul forest, previously referred to, could not be demarcated; but various boundary disputes in Orissa were settled. R358 were expended on new work and R7,592 on repairs, or a total of R7,950 as against R8,493 in the preceding year.

North-Western Provinces and Oudh.—Information, more complete than usual, was furnished on this subject in the administration reports for the period under notice. In the *Central Circle*, where demarcation is practically complete, the necessary repairs were effected. The total length of boundaries is 2,801 miles, of which 389 miles are natural. Of new work, 146 miles were completed at a cost of R936, and 408 miles were repaired for R1,242. In *Oudh*, where the demarcation is insufficient, good progress was made in the renovation of boundary marks; but, as remarked by the Local Government, this work should precede and not follow the survey of the forests now being carried out. The total length of boundaries is stated to be 1,434 miles, and the cost incurred was R10,915 or twenty times greater than in the previous year. In the *School Circle*, attention was paid to this subject, and the expenditure incurred was R2,446 on new work and R979 on repairs.

Punjab.—The work done was unimportant. Form 48, appended to the administration report, shows that the total length of the boundaries at the close of the year was 14,027 miles, of which only 1,114 miles are natural boundaries. The demarcation work of the year extended to 73 miles and 1,500 miles of new work and of repairs, respectively. The total cost has not been correctly recorded in the return, but would appear to have been R3,362, of which R1,626 were expended on repairs to previously existing boundary marks or lines.

Central Provinces.—The boundary delimitation is reported to be practically completed, except in the Southern Circle, where 441 miles are undemarcated. The excision of culturable areas must, however, entail annually a considerable amount of new work for some time to come. Taking the provinces as a whole, the external and internal forest boundaries are 23,118 miles in length, of which 2,073 miles require no artificial demarcation. On new work R3,460 was spent, principally in the Northern Circle, over 390 miles of boundaries. Repairs over the immense total of 18,997 miles were executed; but, as the cost was only R6,447, or about one rupee for every three miles, the repairs must have been generally of a trifling kind. The total expenditure amounted to R9,907 as against R9,508 in 1891-92.

Burma.—Effort was made to carry out important boundary work, the necessity of which in the constitution of forest estates, is fully recognised. Progress in the delimitation of the reserves was, however, retarded, owing to sickness and casualties among the staff, and to the increase of other business generally. In *Lower Burma*, the total expenditure under this head, during the 15 months reported on, was (Form No. 61) R6,440, of which R4,315 was incurred in the Pegu Circle. For both circles the total length of boundaries at the close of the period is recorded as 3,976 miles, of which 2,890 miles are in Pegu. Form No. 46 appended to the report indicates that there is, on the average, 1·5 miles of boundary for every square mile of forest. In *Upper Burma*, the expenditure on new demarcation was R7,316, as against R3,758 in the previous year. Work was carried on most actively in the Eastern Circle. The total length of boundaries was reported to be 1,554 miles, of which 285 miles require no artificial marks.

Assam.—Sufficient attention was paid to boundary work during the year. The total length of boundary is stated to be 2,379 miles, of which a large portion, or 1,193 miles, does not, as stated in the Review for 1891-92, require artificial delimitation. Of new work, 22 miles were laid down at a cost of R3-12-4 per mile. On repairs, R3,187 were expended in the clearing of 1,120 miles, at a cost of R2-13-6 per mile, a rate slightly less than that for 1891-92. In all divisions a reduction of expenditure took place under this head, and in Darrang, the high cost-rate, referred to in the last review, was reduced from R9-3-0 to R6-6-0 per mile. Sixty-four per cent., or 761 miles, of the demarcated boundaries was personally inspected by the divisional officers concerned.

Coorg.—The energy which characterized the conduct of work under this head in 1891-92, was continued in the year under report. Of new and old lines, 71 miles and 337 miles were respectively cut and cleared at a total cost of R1,726. The condition of the boundaries is stated in the table prefixed to this section.

Ajmere.—Of the total length of 183 miles of artificial boundaries, 6 miles were repaired during the year at a cost of R117.

Andamans.—The report omits the prescribed return tabulating the condition of the boundaries and the work done, but states that 14 miles and 13 miles of new and old boundaries were opened and repaired, respectively. The total cost incurred was R1,350, and the cost-rates for work actually done during the year were—for new work R27 per mile, and for repairs R22 per mile. It is explained that the recent cyclone accounts for the heavy and accordingly expensive nature of the delimitation.

Baluchistan.—Some petty work was undertaken at a total cost of R44.

Berar.—The prescribed table (No. 48) forwarded with the report is not complete, and considering the importance of this subject in connection with forest settlement, insufficient information was given by the Conservator. For the forests of Class A, the most important, the total length of boundaries is 1,011 miles, of which 66 miles were newly opened at a cost of R807, and 334 miles repaired at a cost of R426. The total expenditure, in respect of all classes of forest, was (Form No. 61) R2,962.

Madras.—The work done under the heads of preliminary and final demarcation notably increased as compared with the results obtained in previous years. Demarcation extended over a length of 5,464 miles during the period, and of this total, 2,837 miles, or slightly more than one-half, represent permanent work. The Government of Madras, in reviewing the account of work done, compiled by the Board of Revenue, remarked on the inaccuracy of the returns, especially as regards cost incurred. The total expenditure amounted to R73,804, or an average rate per running mile of R13-8-0, as against R11 in the two preceding years. The correctness of these figures is, however, doubtful.

Bombay.—The Local Government, in its orders on the administration reports, remarked that "the importance of this work, with a view to prevent encroachment, and clearly define forest boundaries, appears to be well understood." For the Sind Circle details of the work done were not given, but in the Presidency proper it would appear that 2,040 miles of boundary lines were cleared and R21,852 were expended on erecting cairns and other marks. For the Southern Circle the information in the body of the report is confined to the heading "Demarcation."

IV.—SURVEYS.

The outturn for the survey year has been brought up to 3,974 square miles, or to nearly double the area which was dealt with five years ago. This is satisfactory; but I am not contented with the means at my disposal for summarizing the results of the year. Most of the Conservators have in their reports adopted, as directed, the survey year for recording work under this head; but some of them have not, and it is difficult to apply accurately the necessary corrections. I cannot, therefore, claim exactness for the appended table which, however, suffices to show the annually increasing progress made in the survey of the State forest property.

It is evident that, wherever working-plans must be based on area and sylvicultural prescriptions, accurate maps are an absolute necessity; and it is with this in view that the main efforts have, of late years, been made in the forest survey of the Central Provinces.

In forests where the scheme of working is based on volume of material and number of trees the same degree of accuracy is usually not required. Thus the maps made by local Forest Officers in Burma, in connection with valuation surveys, will, at the outset, suffice for the approximate calculation of the growing stock and for the application of that area-check, which, without a complete and sufficiently localized valuation of the crops, is indispensable in the conservative treatment of our forests. These facts render the local surveys in

Burma of special value. These surveys are not, however, included in the following return of regular forest surveys :—

Presidency or Province.	Surveyed with topographical detail on the following scales.																				Total Topographical Surveys.		Survey of Boundaries only.	
	1″=1 mile.				2″=1 mile.				4″=1 mile.				8″=1 mile.				16″=1 mile.							
	1892-93.		1891-92.		1892-93.		1891-92.		1892-93.		1891-92.		1892-93.		1891-92.		1892-93.		1891-92.		1892-93.	1891-92.	1892-93.	1891-92.
	Area surveyed.	Cost rate per square mile.	Area surveyed.	Cost rate per square mile.	Area surveyed.	Cost rate per square mile.	Area surveyed.	Cost rate per square mile.	Area surveyed.	Cost rate per square mile.	Area surveyed.	Cost rate per square mile.	Area surveyed.	Cost rate per square mile.	Area surveyed.	Cost rate per square mile.	Area surveyed.	Cost rate per square mile.	Area surveyed.	Cost rate per square mile.				
	Sq. ms.	R	Sq. ms	R	Sq. ms.	R	Sq. ms	R	Sq. ms.	R	Sq. ms.	R	Sq. ms.	R	Sq. ms.	R	Sq. ms.	R	Sq. ms.	R	Sq. ms.	Sq. ms.	Linear miles.	Linear miles.
Bengal	...	...	...	...	...	...	...	...	...	...	327	(a) 139	...	...	...	...	...	...	...	...	...	327	...	...
North-Western Provinces and Oudh	...	...	...	...	...	...	...	...	251	18	...	...	...	...	...	...	...	...	...	...	251	...	...	...
Punjab	630	10	365	14	...	...	...	...	124	59	160	53	...	...	...	...	...	...	...	...	754	525	...	...
Central Provinces	...	...	...	...	...	...	...	...	628	(a) 90	483	(a) 119	...	...	...	...	80	(b) 50	149	(b)	1,190	1,100	1,293	1,767
	...	...	...	...	...	(a)	...	(a)	482	(b) 50	477	(b) 47												
Burma (Lower)	...	...	...	...	113	61	68	66	214	(a) 100	226	(a) 175	...	...	...	...	...	...	...	...	438	422	378	636
	..	...	...	...	7	not given	...	...	104	82	128	86												
Assam	...	...	...	...	...	...	...	...	*126	90	307	42	...	...	...	...	...	...	...	...	126	307	52	51
Madras	...	...	...	...	...	...	...	...	788	(a) 70	659	(a) 77	...	...	...	...	...	...	...	...	788	659	139	853
Bombay	...	...	...	...	...	...	...	...	220	(a) 81	195	(a) 85	185	(a) 150	204	(a) 170	22	(a) 100	40	(a) 187	427	437	534	406
Total	630	...	365	...	120	...	68	...	2,037	...	2,962	...	185	...	202	...	102	...	189	...	3,974	3,786	2,596	3,205

* Includes revised survey of 31½ square miles.
(a) Survey of India Department rate, excluding triangulation and traversing; other rates are those of Forest Survey Branch.
(b) Average cost of both 4″ and 16″ scales, including expenditure on the 16″ boundary surveys and classification of forests and soils.

The total cost of forest surveys amounted during the financial year to about R4,24,230.

Bengal.—Work under this head was unimportant. The Survey of India was not engaged on field work connected with any of the Government forests, and did not publish during the year the maps of the Buxa and Jalpaiguri reserves surveyed in previous years. With a view to ascertaining the extent of the forest and unoccupied waste in the Khurda Estate, the Director of Bengal Surveys was requested to prepare from existing information a map showing the boundaries of the settled lands. In reviewing the Forest Report for the year, the Government of India noticed that no mention was made of survey operations in connection with the newly-constituted protected forests of the Chota Nagpur Division, referred to in the first section of this Review.

North-Western Provinces and Oudh.—The most important work undertaken was the survey of the reserved forests in Oudh, the commencement of which, by the Forest Survey Branch, was sanctioned by the Inspector General of Forests in June 1892. An area of 251 square miles was surveyed, at a cost-rate of R18, on the 4″ scale. Operations were restricted to the Pilibhit (153 square miles) and Bhira (98 miles) forests, in which the total cost per square mile, including traversing and check, or partal, surveys, was about R22. When comparing this with the cost of other survey-agencies the Local Government mentioned that the forest maps in the Central Circle on the same scale, but published by the Imperial Surveys, cost R115 per square mile. In the Central and School Circles minor departmental surveys were carried out during the period.

Punjab.—The return of forest surveys furnished by the Conservator shows that about two thirds of the reserves, and one-fifth of the protected and unclassed forests, have been mapped, but the adequacy of existing surveys is not alluded to, nor is it mentioned over what proportion of the unsurveyed area (3,239 out of 4,107 square miles) survey work should be extended. The survey of the Bashahr State was resumed in continuation of the previous year's operations, and the total topographical work done was 754 square miles as compared with 525 square miles in 1891-92. It should be remembered, however, that these areas do not merely include forests, as the whole country was under

survey. The expenditure incurred was R13,975, and the cost-rates were R10 for 1-inch and R59 for 4-inch survey. No. 18 (Himalayan) Party of the Survey of India completed the topography of 267 forests, aggregating 101 square miles, in the Simla Hill States and in the Kangra and Hoshiarpur districts. The cost-rate for the work, which is on the 4-inch scale, was R72. Other survey work does not call for notice.

Central Provinces.—Operations were actively pushed on as the need of maps in connection with the organization of forest working was and is still much felt. The Forest Survey Branch was at work in Raipur, Bhandara, Balaghat, Jubbulpore, and Narsinghpur, and a party of the Imperial Suryeys in Nimar. By the former agency 482 square miles on the 4-inch and 80 square miles on the 16-inch scale were surveyed at an all-round average cost of R50 per square mile. No. 14 Survey of India Party surveyed 628 square miles on the 4-inch scale, the cost rate being R99. In addition, triangulation extended over 873 square miles, and traversing over 605 linear miles. By both agencies the classification of the forest growth and soil was recorded on the maps. The delay in the publication of maps has been great, owing to the inability of the press to cope with its work. The Conservator, Southern Circle, remarked that although the surveys had been in progress for five years, not a single map had been received. To remedy this evil the Inspector General of Forests arranged in 1893-94 for the *ad-interim* issue of cheap prints which will serve the purpose until the maps can be published in proper form.

Burma.—Good progress was made in regular survey operations by the Imperial Survey Party No. 20 in the Toungoo division, and by the Forest Branch of the Imperial Survey in Tenasserim and in the Pyinmana Division. Work done by the former agency consisted of the detailed survey of 214 square miles on the 4-inch scale, and of 113 square miles on the 2-inch scale; while 402 and 300 square miles were traversed and triangulated, respectively. The character of the country, which consists of a mass of low hills of much the same height and bearing high forest, rendered work expensive, and sickness also interfered with the operation. The Forest Survey Branch resumed work in the Salween Division; but in this case also the survey was interrupted by the ill-health of the staff, the whole of which eventually broke down with dysentery and fever. Nevertheless, a fair outturn of work was secured, at a cost per square mile, as will be observed from the above table, 50 per cent. less than that of No. 20 Survey of India Party in Toungoo. In Pyinmana only preliminary triangulation and traversing was done. As regards *Upper Burma*, a special feature, which was noticed with satisfaction by the Government of India when reviewing the year's work, is the mapping of large areas by local forest officers. These surveys are executed in conjunction with the exploration of the forests, and although the maps are not so accurate and detailed as those of regular surveys, yet they are in most instances accompanied by valuation estimates, and are consequently of much use in the selection of reserves, final settlements and the framing of working-plans.

Assam.—The survey of the forests in the Goalpara District was resumed in continuation of the previous season's operations, and was completed so far as field work is concerned. The area topographically surveyed on the 4-inch scale was 126 square miles, and the cost-rate was R90 as compared with R42 in the previous year. The high cost of the survey in the year under review is altogether unusual in the proceedings of the Forest Survey Branch, and was due to the scattered nature of the work, and to the fact that it was found necessary to re-check in detail the greater portion of the results secured in 1891-92. The demarcation and survey of the Bhutan-Goalpara boundary was also completed during the year.

Coorg.—With reference to the remarks in the Review for 1891-92, it is again to be observed that information in sufficient detail is not recorded in the Deputy Conservator's report for 1892-93, which, as regards surveys, deals with the preceding survey year closing 30th September 1892. As the Administration Report is dated September 1893, it would have been convenient to have recorded, as is done in other provinces, the work carried out in the survey year 1892-93.

Ajmere.—In this division, as well as for the *Andamans* and *Baluchistan*, there is nothing to record under this head.

Berar.—Some minor work in surveys was undertaken, but efforts were principally directed to the drawing of small scale maps from existing survey-records. These maps are urgently required for working-plans purposes, and arrangements were made by which maps of all the taluks would be ready for publication in October 1893.

Madras.—Survey operations were conducted by No. 19 Survey of India Party, in continuation of the previous season's work, in Salem, Madura, Coimbatore, and North

Arcot. Owing to favourable weather and to the absence of sickness among the staff, the largest outturn so far accomplished, *viz.*, 788 square miles, was surveyed on the 4-inch scale. Notwithstanding that the physical difficulties to be overcome were not less, a further and satisfactory decrease in the charges per square mile occurred, as will be seen from the following figures of cost, including triangulation and traversing, for the five years ending with 1892-93: R162, R149, R112, R97, and R78. The work done by the Forest Department was not encouraging, but better progress in future is anticipated in consequence of a scheme recently started for the training of Foresters in survey operations.

Bombay.—No. 17 Survey of India Party was employed, as in the previous year, solely on forest work, and carried on operations in Poona, Kolaba, Kanara and Thana. Topographical work on the 4-inch, 8-inch and 16-inch scales, aggregating 427 square miles, was completed, and the progress made appeared to the Local Government to be satisfactory. Preliminary objection was, however, taken to the expensive survey on the 16-inch scale (cost-rate R190) of scattered fringes of babul forest in the Poona district. The view that the expenditure appears excessive in proportion to the resulting advantages certainly appears to be well founded. As will be seen from the statement prefixed, surveys on this scale, carried out by the Forest Survey Branch in the Central Provinces, are conducted at one-fourth of the cost incurred in Bombay.

V.—WORKING-PLANS.

The general policy sketched in the beginning of this Review can, in my opinion, be carried into effect only on the basis of local enquiries; and working-plans are, therefore, the most desirable and most complete medium by which we can in each case attain the aim in view. This proposition may justify me in treating this subject at somewhat greater length than usual, and in discussing the questions involved, without merely reviewing the progress of the year under notice. The primary aim of each working-plan is always the most advantageous utilization of the area for which the plan is framed. The most advantageous utilization is not always, however, either the production of the largest quantity of timber or other forest-produce, or of the greatest net revenue. The rule that each area should be made to produce the largest possible quantity of material is subject to modification, in so far as it can be satisfactorily proved that the requirements of the surrounding population, which has a primary interest in the area with its advantages and disadvantages, should be provided in any special manner. In framing a working-plan, therefore, it is not sufficient to consider the liabilities with which the area in question is legally burdened. The character of the demand and the requirements of the adjacent country must also be duly weighed and provided for, as far as other considerations, based on the laws of nature and on the general advantages which the State is entitled to derive from its forest property, will permit.

Over a considerable part of India, in its present stage of agricultural development at least, the production of fodder and the maintenance of extensive grazing-areas are essential; but it is, in my opinion, impracticable to separate further than has already been done the production of fodder from that of fuel, and even of timber. In fact it seems questionable whether, in certain localities, such separation has not already gone too far. It is a well-understood fact that very intense forest management is incompatible with grazing; but it is not necessary that forest management should be intense in all localities, and in most cases where this is necessary, it is quite possible, when both sides of the question are equally and carefully considered, to find a rational compromise by which reserves serve also as fuel and fodder reserves and even as grazing grounds. It cannot for a moment be argued that uncon

trolled grazing, which has caused the devastation of large areas in this Empire, can be justified in any other localities than those wind-swept and arid plains where the herbaceous growth, if not consumed after the periodical rains, withers during the dry months without enriching the soil or causing any appreciable advantage to the next season's crop. In these extreme cases, nature regulates the number of the nomadic herds by their periodical decimation during seasons of drought. In all other instances the disadvantages of semi-nomadic grazing, such as the loss of manure, the under-breeding of cattle, and the small value placed on the latter in certain localities, must be taken into consideration, and must be weighed against the advantages which may be derivable from a greater degree of protection, or against the necessity of such protection on steep slopes, or for other similar reasons. It seems evident that these questions can only be settled by local enquiries, and that it is preferable to provide for them in working-plans, than by the issue of general orders or regulations, more especially as they are entirely absent in many parts of the Empire and of greatly varying importance in others.

As the result of such local enquiries, the Working-Plans Officer should, with due consideration to the geographical position of the area he has to deal with, to the formation of the ground, and to the character of the vegetation, or, in other words, to the possibility of the area in question, lay down the chief object with which it is to be treated. The aim may be the mere maintenance of the forest crops for the protection of underlying areas or for the regulation of the water-supply, etc., the production of timber, or of one particular class of timber, of small material for agricultural purposes, of fuel, of grass, of grazing; or there may be any possible combination of these objects. Whatever the purpose, it is the ultimate aim of each working-plan to provide for the treatment and exploitation of the crop in such a manner as to ensure permanency of supply, and, wherever possible, amelioration of existing vegetation. Arrangements necessary for these purposes render restriction of the utilization of each area within its possibility imperative; but, wherever such restrictions touch upon the material advantages of the surrounding population, they should be introduced with the greatest leniency applicable to each case.

The Working-Plans Officer is thus mainly concerned with the regulation of the treatment of each area and with the exploitation of its produce. The price at which such produce is to be provided to the public, especially for local consumption, or to whom it is to be given or sold, is a revenue question, and, as such, falls within the province of the executive administration. The free grant of forest-produce, the exercise of free grazing, and the reduction in prices in favour of adjacent agriculturists have their advantages and disadvantages which need not be here further discussed. It is, however, within the sphere of the Working-Plans Officer to make the supply of all forest-produce as cheap as possible, and as the amount debitable to its transport very frequently represents a far larger share of its cost to the consumer than the price paid in the forest, the question of suitable export lines should, in every instance, be fully considered.

The subjoined paragraphs, reviewing the progress made in the several provinces in the compilation of working-plans, exhibit a considerable advance, both as regards the extent of the area treated and the practical character of the plans. It is true that, in the majority of the working-plans hitherto prepared in the Bengal Presidency, the clashing interests discussed in the foregoing

paragraphs do not exist; but the principles involved have been recognized in several instances where proposed plans of this kind have come under preliminary discussion. They have also been adequately considered in the plans for the Thana forest divisions in Bombay.

The plans lately sanctioned vary considerably in character in accordance with local conditions. In some instances, mainly in the case of forests of teak, of deodar, of other pines, and of sal forests with more or less irregular crops, they have been based on valuation surveys and prescribe the number of trees to be extracted annually; but this provision is, in almost every case, supplemented by an area-check. For other forests the plans have been based on area and sylvicultural prescriptions, with coupes differentiated by the aid of valuation surveys and stock maps prepared after local inspections. In some cases, as regards forests of very similar character throughout, where either a demand exists for all classes of material produced, or has been ascertained to be much below the annual production, plans have been framed on area and sylvicultural prescriptions without any further regard to the growing stock. The compartments have in such cases been laid out either of equal size or with reference to natural boundaries.

Cases have recently come under consideration where, owing to the shortness of the present demand, sylvicultural prescriptions, based on the requirements of the growing stock, cannot at once be extended over the whole area of the compartments set apart for the coupes of the next few years and perhaps of the whole rotation. In the absence of further considerations it would doubtless have been advisable to reduce the extent of the working-circles in question, in order to locate the coupes for the period of rotation with a greater degree of accuracy, and to secure for the future a more regular sequence of age-classes. In the cases under discussion, however, an early increase in the demand is expected, and on this consideration it has been decided to be advisable to establish working-circles, the compartments of which are considered suitable to meet the probable future demand, but to allow the executive officers to deviate without sanction from the scheme of fixed annual coupes, in preference to making either improvement fellings on a scale which would have no practical effect on the future character of the forests treated, or to leaving unimproved balances in the compartments set apart for each year's working. The plans thus approved of by me localize the annual fellings only so far as to ensure their regular sequence in compact areas, the extent of which is regulated by the annual demand. If the demand increases, as expected by the local officers, to such an extent as to consume during the rotation the whole of the available yield of the working-circles, the future of the forests is entirely safe-guarded by the provision that in no year a larger area may be felled over than the compartment set apart for it, in addition of course to such balances as may be available from short fellings in former years. If the demand falls short of the present expectations, an uncut balance of the working-circle will be left at the end of the rotation in one block, and no harm is done beyond the creation of a sequence of age-classes, which, according to circumstances, will be more or less irregular as regards their extent. I am fully aware that the procedure is not in accordance with either the teaching or the practice of advanced forest science in Europe, and that it has the drawbacks pointed out by me; but we have frequently to deal with conditions differing entirely from those in Europe, and under the circumstances as they present themselves I consider

the present arrangement to be more practical and to be applicable to similar conditions.

I may add that, in the localities in question, the supply of forest-produce is generally in excess of the demand, and that we cannot therefore afford the cost of unremunerative fellings, merely with a view of future improvement; and that by extending our operations beyond the sphere of the demand for the time being, we court the necessity of extending our export roads beyond the immediate requirements of the case, which again represents unavoidable expenditure of money. I have entered into this question at some length, not merely in order to lay the question plainly before the authorities, but also to invite professional criticism.

Bengal.—A working-plan for the reserved and protected forests of the Sundarbans (4,352 square miles) was drawn up and sanctioned during the year. This plan, together with that for the Darjeeling forests (38 square miles), completed in 1891-92, was much required, and will serve to place one of the most important divisions in India in a satisfactory condition as regards the organized exploitation of its forest-produce. Work under this head was not, however, confined to the Sundarbans. Plans were drawn in outline and approved for the sal forests of the Jalpaiguri and Tista Divisions, and notes regarding the future exploitation of the Puri and Angul forests were prepared by the Inspector General after inspecting these districts. Although as in previous years the preparation of plans was delayed owing to the want of officers for this duty, yet considerable attention was paid to this subject, and the progress secured cannot be considered otherwise than satisfactory. The Conservator's administration report for the year shows that, out of a total reserved area of 5,705 square miles, plans have been completed for 2,130 square miles, and have been outlined for 1,338 square miles. A total area of 1,822 square miles need not, the Conservator states, for some years to come be exploited under the provisions of regular working-plans; so that the balance of reserved forest, remaining to be systematically examined with a view to the elaboration of working-schemes, is less than 1,000 square miles.

North-Western Provinces and Oudh.—The administration reports of the three circles treat of this subject in considerable detail. Exceptional activity in the preparation of plans, and in their control, was displayed in the provinces, and the elaboration of new working-schemes is still in progress. As regards the preparation of new plans the experience derived from the working of the too complex schemes first prepared has been fully utilized, and, in reviewing the work of 1892-93, the Government of India remarked on "the practical simplicity and the clearness with which the objects sought for are explained and justified" which characterize the plans recently drawn up. An equally important feature is the efforts made by the local officers concerned to adhere to the prescriptions of the plans, or at least not to depart from them except for adequate reasons and with the sanction of higher authority. The more efficient control now exercised is largely due to action taken in 1891 and 1892 by the Inspector General of Forests, who brought the deviations to notice. As regards new working-plans under preparation or sanctioned in the period of which the operations are now reviewed: In the *Central Circle* the Lansdowne forest plan was completed and acted upon, though not sanctioned during the year, and a very important plan for the forests of the Kumaon Division was under preparation. A revised plan for the Rehar-Garhibulchand forests was almost completed, and the collection of statistics, with a view to the compilation of a general scheme for the remaining forests of the Garhwal Division, was undertaken. Elsewhere statistics, including very interesting observations regarding the growth in sample plots of sal, were collected. In *Oudh*, where, as will be seen from the Review for 1891-92, forest organization was until 1891 in a very backward condition, marked progress was made in the preparation of plans under the guidance of the Conservator. A working-plan was sanctioned for the important sal forests of Kheri, and plans were in course of preparation in all the forest divisions. The Government of India after the close of the year remarked upon the excellent results which have attended in this circle the efforts made to improve during the past four years the organized exploitation of forest-produce. In the *School Circle* a plan for the forests of the Saharanpur Division was in course of preparation. Taking the provincial administration as a whole, it may be held to have easily secured the first place among the various Forest Departments in India as regards the preparation of regular working-plans during the period under notice.

Punjab.—In response to the request made by the Government of India, referred to in the last Review, the Administration Report for 1892-93 fully dealt with this subject. The Conservator furnished for the first time a comprehensive review of the present position and proposed improvement of systematic forest management. Working-plans exist, or are under preparation for one-half of the reserved area, and the preparation of other plans for 13 forest tracts, both in the hills and in the plains, is contemplated. Inasmuch as the forest area of the province, controlled by the Department, comprises enormous tracts of inferior woods, the Conservator contends, and with some reason, that progress made in organized working should not be estimated by the percentage of the gross area now managed under regular working-plans. At the same time, although conditions afford some prospect of improvement in this respect, the view recorded in the Review for 1891-92, *viz.*, that forest organization is in a very backward state, is scarcely controvertible. The remedy would appear to lie in the practice of rendering Divisional Officers responsible for the preparation of plans in all divisions where this can be done. Suitable plans have in this way been prepared in the North-Western Provinces, Oudh, and Bengal, where the superior staff is inadequate or barely sufficient for the work it has to do. The time has gone by when the preparation of working-plans can lightly be considered as a labour to devolve necessarily upon a special agency employed for that purpose, and there seems no reason why this principle should not, as is indeed suggested by the Conservator, be applied in practice in the Punjab, especially in the plains and sub-montane tracts. During 1892-93, the only plan completed and sanctioned was that for the sal forest of Kalesar in the Siwaliks of the Amballa district. The plan for the Bashahr deodar forests was completed, but the proposals, as well as those for the exploitation of similar forests in Pangi, were not sanctioned until after the close of the year. The plans previously prepared for the Simla Municipal forests, as well as for those of Kotguru and Kotkhai, also remained under consideration. Lastly, a plan for the Kalachitta fuel forest of the Rawalpindi district was under preparation.

Central Provinces.—A new departure, referred to at page 14 of the Review for 1891-92, was taken in 1892-93 by "the inauguration," to quote the orders of the Chief Commissioner, "of a provisional working-scheme, in anticipation of the elaboration of regular working-plans." The broad provisions of this very important measure are embodied in the Resolution of the Local Administration, No. 102 of 5th January 1893. Briefly the scheme consists in the sub-division of the forests into working-circles, blocks and compartments, of convenient size and situation, for the satisfaction of local wants, and the restriction of fellings in each circle to the compartments set down for the work of the year. The remaining compartments will remain for the present open to grazing, the cutting of grass and bamboos, and the extraction of minor produce and dry fuel. Except as regards the admission of cattle to graze in compartments recently cut over—a question which merits and will no doubt receive further consideration—there is nothing *primâ facie* in the scheme which does not conform to the application of scientific sylviculture in respect of forests of fairly uniform character and which require little variation of treatment. The present condition of most of the forests in these provinces, consisting as they do of irregular and much-injured crops, requiring in the first place amelioration and regularization by means of improvement fellings or coppice fellings or a combination of both, lends itself readily to an intelligent application of this scheme for the location of fellings on a great scale.

It is obvious, however, that the success attending the application of the Chief Commissioner's orders will directly depend on the care with which the working-circles are formed, and the assuring of conditions essential to ultimate success, such as the collocation within each circle of crops which can be subjected to one and the same method of treatment, and the exclusion of cattle-grazing and sheep-browsing during a certain period—which ordinarily should not be less than ten years, and may often advantageously be longer—after exploitation of the coupes concerned. The administration report for the Northern Circle for the year under notice does not indicate that any special attention has, as yet, been paid to these conditions; but village-supply coppice working-circles were, as reported by the Conservator, formed, their boundaries defined, and coupes for the forward felling of 1893-94 were marked off. This is progress in so far as unregulated fellings have, to a considerable extent, been put a stop to throughout the circle. It would appear, however, that in most cases the working-circles have as yet been laid out on the maps only, without a sufficient detailed study of the crops, the conditions of growth, and the incidence of the local demand. The work done can, therefore, be regarded only as preliminary, however useful it may be as a basis for future elaboration.

The scheme was not, with reference to the Circular of the Government of India, No. 9 F., dated 14th May 1889, and to Section 83 of the Forest Department Code, brought to the notice of the Inspector General of Forests, who was unaware of it until it had been matured. As yet no working-plans have been forwarded from this circle for the approval of the Inspector General.

In the Southern Circle the location of the cuttings of the year seem to have been fixed in all forests where a regular demand exists, but no general scheme has as yet been developed. A plan for the East Pench Range was, however, provisionally approved by the Inspector General, who has since received proposals for the preparation of various plans on the lines laid down by the Government of India in the Forest Code.

In a large majority of cases, working-plans for the forests of the Central Provinces must be based on area and sylvicultural conditions and requirements, modified by the present and probable demand in the near future. The absence of sufficiently good maps has hitherto greatly hampered progress in both circles; but this disadvantage is in the course of being removed, and adequate provisions have been made for the survey and mapping of the whole forest area of the provinces in as short a time as other considerations will permit. In many parts of the Central Provinces, the State forests are largely intermixed with village lands, and this fact and the local character of the cultivation make it essential that such forest-produce as may be required by the agricultural population should be made readily available under the provisions of working-plans. The extent of the forest area facilitates this, and enables the administration to make considerable concessions without necessarily endangering the capital value of the property. The advisability of granting such concessions as may be to the real and permanent advantage of the agricultural population should in every instance be considered in the framing of a working-plan, and be carefully weighed in each case against the sylvicultural requirements. In some instances it may become necessary to sacrifice the latter interests to some extent, and a working-plan may have to provide in this direction; but it is essential that this should always be done on the basis of a full local enquiry.

Burma.—The *Pegu Circle* continued to maintain the lead in the preparation of working-plans. Plans for the Shwele, Kangyi, and Nawin forests were sanctioned during the year, and the working-plans party, under two officers of the Controlling Staff, was occupied in the field during six months. The cost of the party was R12,733, and 198 square miles of forest were examined. In the *Tenasserim Circle* no new plans were drawn up, but the provisions of the existing rough schemes were observed; and in both circles the preliminary plans of operation were generally adhered to.

In *Upper Burma* work under this head is necessarily restricted to preliminary explorations and inspections. Operations were, as in previous years, hindered by the proceedings of settlement and demarcation; yet a certain amount of work was done. In the *Western Circle* the examination of the forests was carried on in all the divisions, and *data* as to growing stock were collected by valuation surveys extending over 4,796 acres. In the *Eastern Circle*, an estimate of the stock of teak in the Mu forests was made, as well as valuation surveys, in Mandalay, Bhamo and Katha, extending over 2,001 acres. As in Lower Burma, the provisions of annual plans of operation were, generally speaking, duly observed.

Assam.—The deficiencies of the province in respect of working-plans and their preparation were discussed in the Review for 1891-92, and need not be here noticed at length. In his orders on the Administration Report for 1892-93, the Chief Commissioner attributed the want of success partly to the inexperience of the officers hitherto employed on such work; and there is no reason to question the accuracy of this view. The field work for the Goalpara sal forests plan, which was commenced in 1888-89, was continued and completed; but the scheme has not yet (1894) been sanctioned. Efforts were made without success to resume work in the Dambu and Darugiri forests by an alteration in the method of treatment prescribed in the plans for those tracts. These plans have, on account of the inaccessibility of the forest, been found unworkable almost since they were first sanctioned.

Coorg.—No fresh plans were submitted for sanction during the period under notice, but existing working-plans and plans of operation were satisfactorily adhered to. A plan for the Attur and Anekadu forests was under preparation, and another for the Devamachi and Mawkal tracts was contemplated.

Ajmere.—A complete plan for the management of the forest resources throughout Ajmere-Merwara was prepared by an officer of the Controlling Staff, deputed from

Berar for that purpose, and was submitted to the Inspector General of Forests shortly after the close of the year. The cost was R2,316 or R17 per square mile. The provisions of this plan have not yet (1894) been sanctioned, and notice of them may therefore suitably be deferred to a future occasion.

Baluchistan.—The Deputy Conservator reported that "there are no working plans in this province, and there is no immediate prospect of any forest being largely drawn upon for supply of timber or firewood." At the same time it would be interesting to know to what extent, if at all, the preparation of plans is desirable, either for the purpose of hindering exploitation in excess of actual forest-possibilities, or of restricting cutting with a view to the re-constitution of injured crops.

Andamans.—Although no working-plans were prepared the importance of this subject, which has again and again been adverted to by the Government of India, was not lost sight of during the year. Valuation surveys of padauk and of other forest species extended over 61 linear miles, or over 1,460 acres, as compared with 613 acres surveyed in 1891-92. As regards padauk, the results obtained appear to confirm the general correctness of the previous estimates. In reviewing the work done, the Government of India remarked on the advisability of undertaking the valuation surveys in a systematic manner, in connection with survey, demarcation and reservation, and with a view to the preparation of permanent working-plans on an extended scale.

Berar.—Fair progress was made under this head, but work was retarded from the want of sufficiently accurate maps. The Conservator, in his report for the period under notice, states that 915 square miles of forest in Class C. were managed under working-plans; but this observation probably refers to plans of operation of a more or less permanent kind, as only one regular plan, that for Penganga, was in force in Berar even at the close of 1893-94. Plans for 889 square miles of A. forest, and for 60 miles of C. forest, were under preparation, thus leaving 2,207 square miles untouched. The plan for the important Melghat forests still remains under consideration.

Madras.—Progress in settlement and demarcation, the inadequacy of the subordinate establishments, and in some cases the want of reliable maps are held by the Board of Revenue accountable for the stagnation of the administration in respect of working plans. It is observed, however, that the system of located fellings has been successfully introduced into the North Arcot and Salem districts, and it is not apparent why, as in the Central Provinces, a reorganization of forest-working on the same lines could not be introduced without great difficulty into other districts. The introduction of such a system only needs in many cases the exercise of some care in the application of technical understanding of the nature of the forest crops concerned, to sufficiently provide for organized forest-working The rules for the location of coupes, for the felling or reservation of trees, and for the exclusion or admission of cattle, may and probably would be simple and short. Such plans and their preparation need not necessarily be a "counsel of perfection," but they would nevertheless in my opinion be practical and regular working-plans. Moreover, the substitution of the coupe for the indefinite permit system, so called, has usually been found to result in practice in the setting free for other duties of a considerable part of the executive and protective staffs, the insufficiency of which at present is urged by the Board in its report as a strong reason for not endeavouring at present to improve the organization of the forests.

Bombay.—Efforts towards regularizing under systematic management the exploitation of the forests continued to be made in all four circles. In the *Northern Circle* operations were confined to the two Thana Divisions, where 317 compartments were demarcated. In its orders on the Conservator's report the Local Government points out that the system in force in Thana, by which exploitation is based on area with sylvicultural rules in subordination, is approved, and supports this view by a reference to the remarks made regarding the working of the sal forests of Assam in the Review by the Inspector General for 1891-92. Where crops are similar in character throughout, demanding practically no differentiation of treatment, exploitation based on area as adopted in Thana may and often is the best that can be devised. But it cannot be held that the mere marking-out of working-circles and compartments on large scale maps, and the subsequent delimitation of these boundaries on the ground, without a previous inspection of the crops, constitutes of itself a reliable working-plan. In Thana the conditions are no doubt such that exploitation by area and cultural rules only can successfully be practised, and it has been entirely successful, though in this case the coupes were originally laid out on a map only. In my opinion this success is due to the great similarity in the

character of the forests, the large number of working-circles, owing to which a general equality of outturn was obtained, and to the nature of the demand. In many cases, however, even in Bombay, where these conditions do not occur together, it will no doubt be found desirable to base the differentiation of coupes, even as regards plans founded on area, on the results obtained by personal enquiry and inspection of the growing stock and other conditions, supplemented, when necessary, by valuation surveys or stock-maps. Thus, for instance, were the scheme applied to an irregularly mixed forest in which the main demand concerns only one or a limited number of species, it might be found that the coupes set apart for some years would yield a large amount of the material required and little or nothing in other years. In the *Central Circle* work was, as in the Northern Circle of the Central Provinces, confined to differentiating blocks and compartments and to demarcating on the ground the compartments set down for exploitation during the year. In the *Southern Circle* it is stated that plans, which, however, had not been finally revised, were prepared for 78,317 acres. Here much less expeditious methods than those considered sufficient in the Northern Circle were employed, and the Local Government, after the close of the year, requested to be informed of the rea sons for this, and why the plans should not be based on area alone. Mr. MacGregor's explanation will, if published, be commented upon in the next Review.

VI.—Communications and Buildings.

I have repeatedly, and again in the present review in the preceding section, urged that the greater part of the price paid by the consumer of forest-produce in India is frequently that portion which covers the cost of transport, and that it is therefore the duty of the administration to facilitate as far as possible extraction of produce by close attention to the improvement of export lines. The question is, however, of importance not only to the consumer but also to the State, as owning large forest-properties which yield as yet, on account of the want of good forest roads, an income small disproportionately to their value and possibility. The absence of suitable export lines is not, however, merely felt within the forest boundaries, where fair-weather roads and leads or slides will often sufficiently meet requirements, but is even more apparent in regard to feeder roads which should connect the forests with the permanent system of district roads. It is more often the case than not that these feeder lines are mere fair-weather tracks, very frequently interrupted by fields during part of the year, and they are consequently useless during the season when draught cattle could be spared for bringing in forest-produce. Personally, I am inclined to think that a portion of the forest revenue might be suitably diverted in helping to construct permanent, if possible metalled, roads, so as to connect the State forests with the larger arteries of traffic, where such exist, or are under contemplation; for it cannot be gainsaid that in many localities even the main arteries are still in a backward state. Under any circumstances, I urgently recommend that the construction of permanent roads, and when the possibility of the forests and the demand for forest-produce warrant it, of tramways, as well as the improvement of waterways, should receive the constant and serious consideration of every officer connected with the forest administration of the Empire. Many of the administration reports fail to elucidate with sufficient clearness this important question, and the progress made has to a certain extent to be gauged by the amount spent on means of communication. This is not always sufficient to judge correctly of the importance of the progress made; and it would be well if the purpose to be served by any particular road were shortly noted. According to the standard applied, however, it is evident, from the following provincial notices, that of late years a considerably greater activity exists in the improvement of export lines than was formerly the case.

Bengal.—Important new road work was carried on in nearly all the Divisions, but principally in Darjeeling, Kurseong, Palamau and Jalpaiguri; and, though much was done, the progress would have been greater had it not been for a prevailing scarcity of labour. In reviewing the work of the year the Local Government expressed the opinion that, while it is necessary to exercise a careful watch over forest expenditure, it would be false economy to retard the much-needed development of forest resources which would be the result of a well-regulated system of communications. The truth of this proposition is obvious, and therefore the considerable progress made in the construction of roads is a subject for satisfaction. The charges under this head were more than double during the year. The preparation of a general scheme for export roads was in abeyance, but it is observed, from the Lieutenant-Governor's orders, that a programme will be prepared as soon as possible. The total charge under the minor head VII (roads and buildings) amounted to R30,442, as against R19,841 in the preceding year, and the proportion in each case of expenditure to gross revenue was 4.09 and 2·51. The corresponding proportion in 1891-92 for the empire was 2·03.

North-Western Provinces and Oudh.—The outlay on buildings and roads continued to be, relatively speaking, exceptionally and satisfactorily high, and amounted to more than one-tenth of the gross expenditure of all kinds. The total charges under the minor head A. VII were, for the three years ending with that under notice, R87,823, R1,03,028, and R1,04,750 Details of the figures for the 15 months und er review are as follows:—

Circles.	Roads and Bridges.		Buildings.		Other works.	Total.	Percentage on gross expenditure.
	New work.	Repairs.	New work.	Repairs.			
	R	R	R	R	R	R	R
Central	6,191	28,444	11,891	9,121	2,781	58,428	16·19
Oudh	1,752	13,190	10,897	6,046	2,484	34,369	7·51
School	10,100	11,584	5,302	5,313	2,391	34,690	9·77
	18,043	53,218	28,090	20,480	7,656	1,27,487	10·87
Total, 1892-93 . . .	71,261		48,570		7,656	1,27,487	10·87
Total, 1891-92 . . .	60,964		38,113		3,951	1,03,028	10·78

The question of providing suitable accommodation for the executive and protective staffs was under consideration, and suitable standard plans for Rangers' quarters were worked out.

Punjab.—Here, as remarked in previous reviews, the expenditure under this head is inconsiderable, and is largely incurred on means of communication for use by the forest staff. Both under buildings and roads the average monthly expenditure was less than in 1891-92. On buildings R7,510 was spent, as against R8,232 in the previous year, and under roads the corresponding figures are R5,430 and R8,791. The highest charges were incurred in the hill forest divisions of Chamba and Bashahr.

Central Provinces.—The success or failure of the scheme adverted to in the preceding section for the improvement of forest exploitation and management under simple working-plans will inevitably depend in large part on the attention paid to the development of forest roads, in which direction the local forest administration is undoubtedly in a very backward condition. It is satisfactory that improvement of forest lines of export is considered by the Chief Commissioner to be "imperatively necessary," and that the construction of feeder roads has been ordered. The Conservator's reports indicate, however, that the total expenditure on roads, including repairs, amounted for both circles to the disproportionately small sum of R6,169. All idea of efficiently providing, within a reasonable time, for the requirements of the province in this respect may be abandoned, unless the charges are very materially increased. Were the expenditure made at all proportionate to that considered necessary in the North-Western Provinces, where new roads are much less needed, the charges would be increased ten-fold. During the year under notice 68 miles of new fair-weather roads were opened out. The total expenditure incurred on buildings and roads was R17,681, as against R15,616 in the preceding year.

Burma.—In *Lower Burma*, R13,700 in all were expended on roads and buildings, of which, however, only R1,120 is chargeable to communications. The charges were mainly

incurred on removing obstructions in waterways, and in erecting or repairing buildings for the establishment. In the Eastern Circle of *Upper Burma*, R13,181 and R3,309 were spent on original works and in repairs, exclusive of work undertaken at the expense of the Bombay-Burma Trading Corporation. The charges in the Western Circle amounted to R136 on roads and R8,979 on buildings.

Assam.—Sufficient consideration seems to have been given during the year to this question. A sum of R13,900 was expended, as compared with R14,181 in 1891-92. The charges on communications were normal and amounted to R4,160, of which, however, only R34 were expended on new work.

Coorg.—It is disappointing to find that, although the importance of opening out communications through the forests is admitted, no new roads were made during the period under notice. Existing roads and bridges were repaired at a cost of R990, while R1,760 were expended on buildings.

Ajmere.—The work executed under this head need not be noticed.

Baluchistan.—Various minor works were undertaken, principally connected with buildings, and the charges incurred amounted to R5,300 on new work and R800 on repairs. Under roads, the principal item was the opening out of a track giving access from the railway to the Ziarat juniper forests.

Andamans.—The Deputy Conservator furnished a further and interesting account of the working of the forest tramway, used for the extraction of padauk timber, which was extended by 2 miles, the total length being now 5 miles. The estimated net saving secured by the tramway during the year was R26,700, a sum equal to the original cost of as much of the line as was used in the fifteen months. The total expenditure on lines of communication was R18,650, and on buildings, principally barracks for the accommodation in the forests of convicts, R1,400.

Berar.—Progress effected under this head was very satisfactory. On roads R22,740 were spent (as against R14,324 in 1891-92) in constructing 44 miles of new lines and in repairing 385 miles of old roads. The schemes, past and prospective, for the development of forest roads in the Melghat, include 425 miles of communication, of which 128 miles remain to be opened out. The scarcely less necessary provision of wells and tanks along roads also received attention, and R2,344 were spent on such works, as compared with R275 in the previous year. On buildings, the charges for the two years were R15,700 and R4,450.

Madras.—The total outlay under this head was R81,530, as compared with R72,497 in the preceding year, and the percentages of charges to gross receipts were, respectively, 5·1 and 4·2. The expenditure on buildings was heavy, and indicated, in the opinion of the Local Government, insufficient supervision. On the other hand, the Local Government considered the outlay on roads to be insufficient, and directed that the general scheme for the development of communications should be expedited. The views of the Madras Government, as expressed in its orders on the administration reports, are unquestionably sound, and, if given effect to, must lead to an expansion of work and a corresponding increase of revenue.

Bombay.—In the *Northern Circle*, the construction of forest roads is not, as a rule, undertaken departmentally, and the expenditure amounted to only some R650. The remainder of the charge under this head of R4,586 was incurred on other work and buildings, and the Public Works Department also expended R6,769 on depôt houses. In the *Central Circle*, the latter Department expended large sums, amounting to some R57,600, on the maintenance of old or construction of new forest roads, and R3,700 was also spent on buildings. In the *Southern Circle* the charges on roads and buildings amounted, respectively, to R2,353 and R6,268. The Deputy Conservator of Forests in *Sind* remarked on the difficulty experienced in conveying fuel, from the forests to the railway or to the Indus river, owing to the absence of suitable lines of transport.

CHAPTER II.

PROTECTION AND IMPROVEMENT.

I.—General Protection.

The efficiency or otherwise of forest protection cannot, in my opinion, be properly gauged from a tabular statement showing the number of breaches of the forest law either compounded or taken into Court for disposal. By comparing from year to year the proportion of convictions to the total number of cases decided by the Courts, it can merely be said whether unwarranted prosecution for forest offences has taken place or not. The returns bearing on this question vary but little, and I have consequently omitted the table in this year's Review.

Neither the local tables, nor the information contained in the majority of the reports, sufficiently distinguish between the character of the offences and the damage done to the forests. I am therefore unable to compile any really useful general note on the subject; but, from personal observation and a study of the reports, I think that, as a rule, offences of a grave nature have become less frequent of late years. They still of course occur; and the destruction of several hundreds of acres of forest-growth for temporary cultivation in the Central Circle of the Bombay Presidency appears to be a forest offence as serious as could well be imagined. Generally speaking, however, the local administrations have to deal with petty offences, which, though trivial in themselves, are dangerous by their frequency and repetition. That such offences must be suppressed is evident; but it is at the same time desirable that the people, and especially the poorer classes, should be treated with every consideration which it is possible to show them without seriously interfering with the aims of forest protection.

It is for this purpose necessary to weigh in each instance the character of the offence, and to take into consideration the locality where and the circumstances under which it took place. For instance, as a natural result of protection, a better grass crop is produced in the closed than in the open areas: and leniency would seem to be misplaced if illegal pasturing of cattle is persisted in, notwithstanding that forest compartments or blocks have been specially set apart for grazing purposes in the immediate vicinity. Such examples might be multiplied to almost any extent; but, on the other hand, where such forest produce as is necessary for the well-being of the population cannot readily be obtained, it may become advisable, wherever this can be arranged without endangering the existence of the forests, to give the poorer classes an opportunity of collecting free of charge, and under such restrictions as may be necessary in each case, the produce they require. It is, in my opinion, impossible to generalize on this question, or to provide for it by rules; but it may suitably be considered in the preparation of working-plans, and each divisional forest officer should have considerable discretionary powers in this respect. A case in point are the provisions made in the Thana working-plans in Bombay, under which the people are allowed for a certain time each year to remove from the coupes branches and twigs below a given size; and the grant of this concession has had excellent results. The advisability of granting such concessions can never be ascertained

from a mere criticism of the increase of detected forest offences, a proceeding which, in some instances at least, has led to a neglect of the necessary protection.

The compounding of forest offences has recently been under the consideration of the Government of India, with special reference to the practice by which part of the compensation realised may be awarded to informers and subordinate officers. The Local Governments are agreed that no abuse has taken place in the working of the compensation clauses of the forest law, and that changes in the present practice are therefore undesirable. This is satisfactory.

Bengal.—The number of offences prosecuted before the Magistracy (175) was, considering that the period embraced fifteen instead of twelve months, materially increased as compared with the corresponding number (79) in the previous year. The large percentage (88) of convictions obtained shows the care with which these suits were instituted, and indicates further that the increase in the number of offences prosecuted was due, as stated, to better supervision. As regards cases compounded by Forest Officers, under section 67 of the Forest Act, the number was considerably reduced, mainly owing to a change of system in the Sundarbans division, under which increased royalty was charged on produce removed in contravention of the rules. The Conservator in his report remarks on the difficulty experienced in compounding offences, owing to the fact that no Ranger in the Circle draws as much as R100 per mensem, and that, therefore, under the Act, no Ranger is qualified to compound. But this difficulty can be and is overcome in some provinces by the Ranger forwarding the papers in the case to the Divisional officer, who passes the order required.

North-Western Provinces and Oudh.—The results of protection under this head, though they indicate a marked improvement on those of the previous year, are not so satisfactory as were secured in 1890-91. The number of court cases was considerably increased, and of those compounded slightly reduced as compared with the average monthly figures for 1891-92. The percentage of convictions in court cases was raised from 74 to 87. The number of offences reported in equal periods corresponds with that for the preceding year, but more cases of illegal grazing were detected in all the circles, and in Oudh fewer "miscellaneous" cases occurred. As regards cases compounded, the average compositions levied varied from R2-7-0 in the Central Circle to R6 in Oudh, while it appears that in some instances in the School Circle the maximum limit of compensation (R50), prescribed by law, was exceeded.

Punjab.—The results of forest police protection during the period under notice cannot be considered altogether satisfactory. The numbers of cases prosecuted in court and of offences compounded were 1,256 and 1,279, as compared with the corresponding figures for the financial year 1891-92 of 1,315 cases and 648 compositions. The percentage of convictions obtained in court cases has steadily fallen from 82 in 1890-91 to 77·8 in 1891-92 and to 71·4 in the period under review. Taking average figures for twelve out of the fifteen months, the number of court cases as compared with the returns for the financial year 1891-92, decreased by 30 per cent., and that of offences compounded increased by 58 per cent. The reasons for the decline in the percentage of successful court cases, and for variations exhibited by the returns, notably the proportion of conviction in Bashahr and the increased number of cases in Rawalpindi, are not apparent from the Conservator's report. The percentage of convictions obtained is, with the single exception of Coorg, lower than that for any other province in India. Cases were compounded principally in the Jhelum and Rawalpindi divisions. The total compensation accepted amounted to R3,806, or on the average R2-15-7 per case.

Central Provinces.—The total number of cases reported in the Northern Circle was somewhat less than in the previous year, while for the Southern Circle the average monthly number was 10 per cent. less. Owing to orders previously issued by the Local Government in connection with the grant of grazing licenses, a marked decrease occurred in the Northern Circle in offences concerning cattle. Both in connection with cattle grazing and the compounding of offences, the Chief Commissioner remarked that forest administration is severer in the Southern than in the Northern Circle. The total number of cases compounded and the number of persons involved were, for the two circles, respectively, 5,067 and 2,6 4 cases, and 15,093 and 6,790 persons. The animad-

versions of the Local Government on the working of the punitive sections of the Forest Act in the Southern Circle, were endorsed in the orders of the Supreme Government.

Burma.—There was a large increase in *Lower Burma* as compared with the previous year, in the number of cases, even taking into account that the returns cover a period of 15 months. The increase is attributed mainly to increased energy in Thayetmyo; but both in respect of this district and of Upper Burma generally, the Chief Commissioner remarked that the people are unaccustomed to the laws, which should be administered with leniency. The percentages of convictions obtained in court cases rose from 89 and 91 in the two preceding years to 92 in that under review. This was the highest percentage obtained during the year in the larger provinces. In *Upper Burma* there was also a considerable augmentation in the number of court cases, which were successfully prosecuted in 83 per cent. as against 73 per cent. in 1891-92. In the Eastern Circle, the detected offences increased two-fold, a result due in some degree to greater vigilance and activity on the part of the staff. A noticeable feature of the year's working was the assistance rendered by the Revenue authorities in the protection of teak and other valuable trees, and in the suppression of illicit cutch-boiling.

Assam.—The Conservator, in dealing with this question, has apparently overlooked the fact that the period reported on covered fifteen, and not twelve, months, and consequently his comparisons are incorrect. Taking average figures for the year ending 31st March 1893, the number of court cases declined by 40 per cent., and that of cases compounded increased 15 per cent., as compared with the numbers for the financial year 1891-92. The percentage of convictions obtained in court cases (78) was slightly reduced, and stood at a figure 4 per cent. lower than that of 1889-90. In reviewing the results, the Government of India remarked that certain offences resulting in forest fires were again compounded, and pointed out that such cases should not usually be thus disposed of, and that, when compensation is accepted, the reasons should be reported to the Conservator.

Coorg.—The results obtained were unfavourable. The number of court cases increased from 18 to 26, but the percentage of convictions obtained (56) is very low and exhibits a marked decline on the percentage for 1891-92. This lack of success is ascribed by the Deputy Conservator to want of knowledge on the part of the prosecuting officer. The variation in the number of cases compounded was also considerable, the increase (191 as compared with 12) being due to more grazing offences having been disposed of in this manner, instead of, as in previous year, not having been treated at all as forest offences.

Ajmere.—The offences prosecuted before the Magistrates increased from 86 to 161, in consequence of the abuse by villagers in the Todgarh tehsil of privileges granted to them by the Commissioner, and the percentage of cases resulting in conviction was 98 as compared with 97 in 1891-92. The cases compounded declined in number by 37, for reasons not stated in the report. Owing to a favourable season and a plentitude of grass, the number of animals impounded for trespass was reduced, notwithstanding the additional period of three months embraced by the report, from 5,442 to 1,926 head.

Baluchistan.—The number of breaches of the forest rules was 354, or more than double that of 1891-92. The number of cases tried by Magistrates (47) and of those compounded (307) were, respectively, two-thirds less and sixteen times greater than the figures of the previous return. But these differences were insufficiently commented upon by the Deputy Conservator.

There was a large increase in the number of animals impounded, as well as of those on account of which compensation was accepted for illegal grazing. Very little damage was done to the reserved forests during the year, and the Deputy Conservator reported that the recently introduced protective rules affect but little the people of the country.

Andamans.—As is customary in the settlement, the few breaches of the forest rules, eight in number, were settled as convict offences.

Berar.—In the Review for 1891-92 it was pointed out that better results under this head might be expected consequent on the impending application of the provisions of the recently enacted Forest Law. Inasmuch as the new law permitted a large number of trivial offences, which would under the former system have been prosecuted in the courts or condoned, to be compounded, the results cannot be compared with those of previous years. But the results of cases prosecuted before the Courts do not appear to have been as good as they might have been. The cases decreased from 373 to 319, but

convictions were only obtained in 79 per cent., as against 83 and 85 per cent. in the two years immediately preceding. The compositions accepted amounted to R605 in 65 per cent. of the total number of cases.

Madras.—The returns of forest offences in the Madras Presidency cannot be readily compared with those in other forest circles, because the figures do not distinguish between cases prosecuted in court and cases compounded, whether in respect of cases pending at the beginning and end of the year, or of new cases or of cases withdrawn. Although there was an increase in the total number of cases during the period under notice, the Board and the Local Government appear to be mistaken in the view that the increase is large as compared with previous returns. Not merely was the increase much less than for 1891-92 ; but, when account is taken of the extra period of three months involved, the actual increase may be assumed to be about 500 cases, and 563 cases in the Godaveri District should not, as is explained, be considered. The total number of cases for disposal during the period, including a balance for 1891-92 of 1,556, was 12,461. Of this total, 696 cases were "withdrawn," 4,106 were compounded, and 5,676 were dealt with by the Magistracy. Of the latter cases, the percentage of acquittals was 21·5 as against 24·4 in the previous year. The divergency of the results obtained in different districts indicates that the penal sections of the Madras Forest Act were somewhat irregularly applied. Instructions were, however, issued by the Board to the Conservators and Collectors with a view to remedying this state of things.

Bombay.—The percentage of failures was higher in all the circles, especially in Sind and in the Northern Circle, than for the previous year. In this connection the Bombay Government, in its orders on the administration reports, made the following remarks which are generally applicable in India and may suitably conclude this section: "Different Magistrates hold different views as to the gravity of offences against Forest Law and as to the nature and amount of evidence sufficient to justify convictions in such cases. . . There appears, however, to be on the whole a prevailing disposition on the part of the Magistracy to treat forest offences leniently. It is the policy of Government to prevent forest restrictions from becoming harassing so far as is possible with due regard to the paramount importance of preserving the sources of supply. Leniency in dealing with breaches of forest law is proper in the case of first offences and petty and isolated pilfering for personal use. It may also be proper when restrictions necessitating sudden changes in the daily habits of the people have been recently introduced and are imperfectly understood. But leniency is misplaced and destroys the current effect of forest prosecutions when forest depredations, however trivial they may appear when considered as individual and isolated acts, have become in any locality, in spite of repeated warnings, systematic and persistent."

II.—Protection from Fire.

The gross area successfully protected from fire by the adoption of special measures was again increased, and amounted to 27,438 square miles against 23,461 in the preceding year, 23,114 in 1890-91 and 15,570 square miles ten years ago in 1883-84.

The fire season is the most trying and anxious time for the majority of forest officers in India, and the greatest credit is due to them for the constant extension of fire-protected areas, which can only be secured at an increase of harassing work and great exposure during the hottest season of the year. It is, under these circumstances, a matter which cannot be too highly appreciated that, of recent years, the interest taken by revenue officers in this important branch of forest administration has been visibly growing, and that in many parts of the country the people are becoming more careful in the burning of grazing-grounds adjacent to protected forests, and, moreover, often actively assist in fire-protection and in the suppression of fires. This assistance, without lessening the credit due to forest officers of all grades, has helped considerably towards securing favourable results, and cannot be too gratefully acknowledged.

The following table gives a summary of the results. It will be observed that the percentage of failures has decreased, and that the average cost of protection has at the same time been lessened.

PROVINCE.	Area in square miles.				Proportion of failures to area attempted.		Cost.				Proportion of area under fire-protection to total area of reserves (including *leased* forests).	
	Attempted.		Protected.				Per square mile protected.		Per acre protected			
	1892-93.	1891-92.	1892-93.	1891-92.	1892-93.	1891-92.	1892-93.	1891-92.	1892-93.	1891-92.	1892-93.	1891-92.
					Per cent.	Per cent.	R	R	Pies.	Pies.	Per cent.	Per cent.
Bengal	1,889	1,975	1,872	1,574	1	20	4	8	1	2	33	38
North-Western Provinces and Oudh(*a*)	2,610	(*b*)2,361	2,548	(*c*)2,287	2·3	*3·1	19	*21	5	*6	(*d*)70	(*e*)*63
Punjab	287	297	286	260	0·3	12·4	5½	8	1·6	2·5	(*j*)4·7	(*j*)4·7
Central Provinces	5,634	3,870	5,604	3,659	1	5	10	14	3	4	57	20
Burma (Lower)	516	501	482	496	6·6	1	60	63	18	19	(*k*)9·6	(*k*)9·7
Burma (Upper)	14	(*f*)14	14	(*g*)11	...	*21·4	63	*72	19	*21	0·6	*1·1
Assam	1,119	1,141	1,113	1,003	0·54	12	14	19	4	6	(*j*)10	(*j*)11
Coorg	205	204	190	179	7	12	33	30	10	9	(*j*)23	(*j*)24
Ajmere	92	(*h*)81	92	(*h*)81	...	...	1½	*0·9	0·44	0·16	66	*58
TOTAL	12,366	10,444	12,201	9,550	1·3	8·6	13	18	4	5	(*i*)...	(*i*)...
Berar	1,238	1,137	1,193	1,125	4	1	7	7	2	2	93	90
Total Bengal Presidency	13,604	11,581	13,394	10,675	1·5	7·8	12·5	16·8	3·7	5	(*i*) ...	(*i*)...
Madras	5,100	4 597	4,857	4,330	4·8	5·8	14	10½	4	3	(*j*)29·7	(*j*)27·7
Bombay	10,490	10,290	9,187	8,456	12	18	3	2	0·95	0·71	(*i*)72	(*i*)71
GRAND TOTAL	29,194	26,468	27,438	23,461	6	11·4	9·6	10·5	2·9	3	(*i*)...	(*i*)...

(*a*) Fire-protection in the Central Circle extended over *protected forests* as well as reserves.
(*b*) Excludes 360 square miles in the Central and Oudh Circles for which no special fire-protection measures were adopted in 1891-92.
(*c*) Excludes 337 square miles in the Central and Oudh Circles for which no special fire-protection measures were adopted in 1891-92.
(*d*) In Oudh 79 per cent.; in School Circle 83 per cent.; in Central Circle (taking reserves and protected forests into account) 54 per cent.
(*e*) In the Oudh and School Circles 67 and 80 per cent., respectively; in the Central Circle (taking reserved and protected forests into account) 49 per cent.
(*f*) Excludes 1,052 square miles for which no special fire-protection measures were taken in 1891-92.
(*g*) Excludes 190 square miles for which no special fire-protection measures were taken in 1891-92.
(*h*) Excludes 58 square miles for which no special fire-protection measures were taken in 1891-92.
(*i*) Fire-protection was extended to *protected forests* as well as reserves, and the area attempted to be protected included tracts for which no special fire-protection measures were taken.
(*j*) Proportion of area under fire-protection to total area of all forests.
(*k*) Taungya areas not included.
* These figures differ from those given in the last year's Review for reasons recorded in (*b*), (*c*), (*f*), (*g*), and (*h*). The totals have also been altered accordingly.
N.B.—In the Bengal Presidency, areas for which *no special* fire-protection measures were taken have been excluded from this table. In cases where no mention has been made regarding special or ordinary measures being taken, the figures given in Form No. 53 have been generally adopted.

Bengal.—The results under this head during the year under review were, owing in part no doubt to a favourable season, eminently satisfactory. It is, however, necessary to bear in mind that the greater portion of the reserved area is naturally self-protected. Special protection extended over 1,889 square miles of forest; but only 17 square miles, or 1 per cent of the area so protected, were burned, as compared with 401 square miles, or 20 per cent. in 1891-92. The cost per square mile protected has been reduced from R11 in 1890-91 to R8 in 1891-92, and to R4 in the year under review. A noteworthy work was the burning, by departmental agency early in the year, of inflammable savannahs in Jalpaiguri, where so many of the disastrous forest fires used formerly to originate, especially in dry seasons. This radical and wise measure of precaution secured in 1892-93 the objects desired.

North-Western Provinces and Oudh.—As in Bengal, to the favourable season may be ascribed the exceptional immunity of the forests from fire. The best results were again secured in the *School Circle*, where less than one-tenth of the total forest area is not specially protected as against 37 per cent. in the Central Circle. In *Oudh*, notwithstanding the frequent rain throughout the hot season, 34,600 acres were burned over, although

the area over which protection was attempted was somewhat less than for the previous year. The average cost per acre protected in all three circles was 5 pies as against 6 pies in the preceding year.

Punjab.—There was fortunately, owing to climatic conditions, no recurrence of the disastrous fires noticed in the Review for 1891-92. The number of fires was 61 extending over 3,000 acres in all, as compared with 294 fires and 51,000 acres in the preceding year. Of the forests to which special protection was extended, only one square mile, or 0·3 per cent. was burned. The cost of protection was also materially reduced, *viz.*, from R8 to R5-8-0 per square mile.

Central Provinces.—The results, as shewn in the table prefixed to this section, compare favourably with those obtained in 1891-92. The area attempted to be protected was larger, and the percentage of success was raised from 95 to 99. The cost per square mile was R5-14-0 in the Northern and R14 in the Southern Circle; but this difference is attributable in great part to the inclusion in the Northern Circle returns of the large area of 1,222 square miles of forest previously classed as self-protected. Although, therefore, the results obtained are not, strictly speaking, comparable with those of 1891-92, yet the measures actually carried into effect were satisfactory in both Circles.

Burma.—The area protected from fire in Lower Burma decreased by 14 square miles, chiefly owing to failures in the Thayetmyo, Tharrawaddy, and Rangoon divisions; and the average cost, while still remaining high, decreased by one pie per acre. In Tenasserim, the results were particularly good. In Upper Burma, artificial protection was confined to selected areas in the Pyinmana and Ruby Mines districts. The fact that forests protected for some time produce a richer vegetation and assume under favourable circumstances some of the characteristics of an evergreen forest, is interesting. In their orders on the reports of the year, the Government of India observed that, although this circumstance may render the natural reproduction of teak, more difficult, yet it is of special importance that all areas where such reproduction has taken place, or where assistance against the growth of more vigourous species can be given, should be carefully protected. The suggestion that fixed camping-places should, as a precautionary measure against the outbreak of fire, be established in the reserves, seems a good one.

Assam.—The results of protection under this head were satisfactory and contrast favourably with those obtained in the previous year, though, as will be seen from the Review for 1891-92, there was plenty of room for improvement The area "attempted" was slightly reduced; but the measure of success was more than 99 per cent. as compared with 88 per cent. in the previous year. The cost underwent the substantial reduction of R5 per square mile; but in connection both with the reduced expenditure and the success secured, it must be remembered that the season was a favourable one, and that fewer fire-patrols were required.

Coorg.—The results of fire-protection were satisfactory when compared with those of previous years, but were less so than those obtained in other provinces under conditions still more unfavourable. The area over which protection was attempted remained almost unaltered. There was a satisfactory decrease in the percentage of failure, but the cost was increased from R30 to R33 per square mile. The year, however, was not favourable to successful protection. The total expenditure was R6,230 as against R5,290 in the previous year. The Deputy Conservator observed that up to 1892 there had been in effect no organized system of fire-protection. Remedial measures were, however, taken during the year under review, and the subject, as desired by the Government of India, will be specially discussed in the Report for 1893-94.

Berar.—Owing in part to an unfavourable season, fire-protection was not, as will be observed from the table prefixed to these remarks, so successful as in 1891-92. The results, generally speaking, were creditable; but in the Akola district carelessness on the part of the staff occasioned the burning of 40 out of a total of 45 square miles of forest. The total expenditure amounted to R11,189, or 2 pies per acre protected.

Madras.—The proportion of forest fire-protected to the total area on the books of the Department was increased from 28 to 30 per cent., and the results obtained during the year were on the whole satisfactory, 95 per cent. of the total area (5,100 square miles) "attempted" having escaped fire. The charges were R48,990 as against R45,318 in 1891-92; but the cost-rate, as recorded in the table above, is incorrect, as it refers to expenditure in more than one complete fire season. The originating causes of the various fires were not reported, but it was stated that incendiarism was more prevalent than had previously been the case.

Bombay.—It will be observed from the above table that, although the cost of protection was increased from R2 to R3, the results were in other respects satisfactory as compared with those of 1891-92. Greater vigilance was shown by the forest officials in preventing and extinguishing fires, and an especially satisfactory feature in the administration was the assistance rendered by revenue officers in the detection of offenders.

III.—GRAZING.

Next to protection from fire, the regulation of grazing is the most important question in the successful management of our forest areas, and is in many parts of the Empire the most difficult of all. The grazing question is, as a general rule, most acute in places where, for climatical reasons, the forests require the greatest amount of protection; for it is precisely in these localities that the population is most dependent on the forests for its fodder-supply. It cannot be denied that a gradual progress is being made in systematizing the utilization of the fodder-supply in the forests, and rules and regulations with this purpose in view have been promulgated in several Provinces. Such rules are doubtless of considerable importance, but they will not, in my opinion, lead to a final solution of the difficulties, as the conditions with which we have to deal vary in every locality. I am convinced that the only practical way of successfully dealing with the matter is by means of Working-Plans, setting forth the purpose for which each forest area is to be treated, and consequently providing the degree of restriction necessary for the aim in view.

Generalization is not, in my opinion, applicable at present, and moreover gives no clear idea of the real progress made. I have consequently abstained from even summarizing the provincial notes on the subject.

IV.—REPRODUCTION.

(*a*) *Natural.*

In a country like India where every climate is represented, from that of the arid desert to that of a rich and tropical forest, and of the upper slopes of the Himalayas, natural reproduction presents many and different features.

Even in the semi-desert we find bushes and trees with long tap-roots penetrating to the permanent moisture in the soil. How such vegetation springs into existence, how it reproduces itself, are problems which we have not as yet been able to satisfactorily solve by the close protection and examination of pattern areas. But it seems safe to assume that it begins life under periodically-occurring and exceptional circumstances; that for many years the main development takes place below the surface; and that it only makes an appreciable growth above ground when it has established its connection with the permanent moisture in the soil.

In the arid Baluchistan hills, it has been ascertained that the reproduction of the juniper takes place, as a rule, only under the immediate shelter of the long sweeping branches of the parent tree.

In the Sundarbans, and similarly situated forests, reproduction occurs under the influence of the tides, and is so luxurious that we often find as many as 4,000 stems per acre.

In the tropical forests of Burma and of the Andamans, it is the very luxuriance of growth which renders it so difficult to secure the reproduction of those few species which represent the chief value of the forests. It will be seen from these few facts, selected from many, that it is impossible in an annual Review to give any idea of the progress of forest reproduction in the Empire,

or even in any particular Province. The suggestion, made in my last Review, that specific cases should be selected for special enquiry and report in each Province has not as yet been acted upon. It would be well if this were done.

A considerable proportion of our forests in all the Provinces is not subjected to the extremes of climate indicated at the beginning of this notice. Progress in the reproduction of these areas is generally satisfactory soon after fire-protection has been established, and when grazing has been excluded or sufficiently regulated. That very great strides have been made in generally improving the forest conditions of this country cannot be gainsaid. The question, however, is one which cannot be satisfactorily dealt with in an annual Review. It is again in our working-plan reports that information, under this head, can most suitably be recorded.

(*b*) Sowing and Planting.

The following table shows the progress made in the cultural operations undertaken by the Forest Department :—

Province.	Area in acres.															
	At commencement of the year.				Added during the year.				Excluded during the year.				Balance at the close of the year.			
	Regular Plantations.	Cultural Operations.	Taungyas.	Total.	Regular Plantations.	Cultural Operations.	Taungyas.	Total.	Regular Plantations.	Cultural Operations.	Taungyas.	Total.	Regular Plantations.	Cultural Operations.	Taungyas.	Total.
Bengal	3,153	1,282	...	4,435	40	22	...	62	...	...	...	...	3,193	1,304	...	4,497
North-Western Provinces and Oudh.	2,811	2,983	...	5,794	...	364	...	364	...	20	...	20	2,811	3,327	...	6,138
Punjab	14,241	6,760	...	21,001	(a) 665	589	...	1,254	(b) 10,830	(c) 784	...	11,614	4,076	6,565	...	10,641
Burma (Lower)	3,947	3,495	25,458	32,900	35	77	2,630	2,742	9	...	357	366	3,973	3,572	27,831	35,376
Burma (Upper)	6	19	...	25	62	351	...	413	...	...	...	...	68	370	...	438
Assam	2,138	182	...	2,320	300	10	...	310	...	1	...	1	2,438	191	...	2,629
Coorg	1,685	125	...	1,810	141	146	...	287	...	...	...	...	1,826	271	...	2,097
Ajmere	634	...	...	634	148	...	...	148	57	...	...	57	725	...	...	725
Baluchistan	1,733	11	...	1,744	1,007	...	...	1,007	...	...	...	...	2,740	11	...	2,751
Andamans	81	233	...	314	...	320	...	320	...	...	...	...	81	553	...	634
Total	30,429	15,090	25,458	70,977	2,398	1,879	2,630	6,907	10,896	805	357	11,958	21,931	16,164	27,831	65,926
Berar	655	3,577	...	4,232	...	3,557	...	3,557	...	68	...	68	655	7,066	...	7,721
Total Bengal Presidency	31,084	18,667	25,458	75,209	2,398	5,436	2,630	10,464	10,896	873	357	12,026	22,586	23,230	27,831	73,647
Madras	(d) 49,284	6,425	...	55,709	(e) 335	391	...	726	(f) 239	...	...	239	49,380	(g) 6,816	...	56,196
Bombay	10,900	345,586	...	356,486	2,623	104,355	...	106,978	20	6,009	...	6,029	13,503	443,932	..	457,435
GRAND TOTAL	91,268	370,678	25,458	487,404	5,356	110,182	2,630	118,168	11,155	6,882	357	18,294	85,469	473,978	27,831	587,278

(*a*) 32 acres obtained by rectification of previous area figures.
(*b*) 4 acres due to river erosion.
(*c*) 2 acres lost by landslip.
(*d*) Includes 28,525 acres of topes.
(*e*) Of this 16 acres obtained by rectification of previous area figures.
(*f*) Due to rectification of previous area figures.
(*g*) Besides 100 miles of channel banks.

The total expenditure incurred under this head amounted to R3,38,970, distributed over the various Provinces as follows :—

	R		R
Bengal	5,070	Coorg	6,060
North-Western Provinces and Oudh	26,790	Ajmere	1,450
Punjab	41,210	Baluchistan	23,890
Central Provinces	4,520	Andamans	4,160
Burma (Lower)	67,310	Berar	3,550
Burma (Upper)	4,260	Madras	96,690
Assam	23,470	Bombay	30,540

Compared with the vast extent of the forest areas under the control of the Government of India, the acreage treated by artificial means, and the amount spent thereon, is extremely small if judged from an European standpoint. It is, however, the very extent of the forest area and the comparatively small income per acre which forces us to depend almost entirely on the natural reproduction of the forests. Artificial cultivation is, as a rule, only resorted to in the case of irrigated plantations in regions where the natural forest-growth is abnormally slow and uncertain ; in forests from which only a few of the most valuable species are exploited, and where artificial help is consequently necessary to maintain and improve, if possible, the character of the growth ; in areas where it is desirable to introduce specially valuable kinds of trees, such as sandal-wood ; and in some instances in the filling up of blanks.

In regard to the improvement of the growth in forests from which only the most valuable timbers are extracted, Burma easily takes the lead with its extensive *taungya* plantations and cultural operations on areas where the bamboo has seeded and died ; and it is confidently expected that, in spite of the enormous extraction of teak, the ultimate possibility of the forests will not only be maintained but be largely increased. The correct treatment of these and of similarly exploited forests probably represents the most difficult problems which scientific forestry is asked to solve in any country.

The *taungya* system is, with more or less success, gradually being introduced into all provinces. Where the forest-growth is naturally vigourous and the rainfall sufficient and seasonable, this is probably the best and cheapest method of creating groups of forest of a higher class than the surrounding growth ; and it may be expected that improvement of this kind will spread in future generations of the forest life.

Much good is done, especially in Bombay, by assisting nature in dibbling in seed and in sowing broadcast, chiefly over newly filled areas. The method is hardly scientific ; but, as it is mostly carried out by guards and other forest employés, it costs little or nothing ; and on the principle that some of the seed must fall in fruitful places, the work shows, by constant repetition, undoubtedly good results.

V.—Improvement of the forests by the axe.

The necessity of improvement fellings, which, owing either to former mal-use of the forests or to the particular demand on them for one or a few species only out of mixed forest growth, exists in the majority of our Indian forests, is now universally recognized ; and steady progress is taking place in this respect The introduction of working-plans, the compilation of which necessitates a study of the conditions of a forest area before proposals for its utilization can be propounded, has done away with the practice previously existing in many localities under the misnomer of " selection fellings," *viz.*, of merely removing the best mature timber to the market. In most of the working-plans and of the preliminary proposals for systematic working which come before me for scrutiny, the final improvement of the forest area dealt with is fully provided for, and the plans are, so far, generally acted up to. No sacrifices of the capital value of the reserves in order to swell the present income are any longer permitted. It is of course self-evident that the course of forest improvement by means of improvement fellings is a long one, and is further impeded in many localities by a short demand for produce.

The improvement fellings executed under working-plans may be divided into two main categories. The first deals with deteriorated forests, where it is desirable to cut misshapen and diseased trees—sometimes gnarled and bush-like—down to the stock, in order to encourage a healthy coppice growth to come up with the seedlings of the selected parent trees left standing on the ground. These cuttings vary in intensity, in accordance with local conditions, from gentle thinnings to fellings of a severe character, which may be described as cuttings for coppice with standards. The second main class deals with the removal of inferior species of trees round parent stems and over young growth of a better kind, or the cutting of old useless trees, even of a better class, when shading their own offspring.

As regards the removal of inferior species we are not so much tied down by the existence of a market; for in cases where the removal does not pay, the stems are simply girdled and killed. Still even this costs money, and above all necessitates supervision which cannot always be given. The progress is, therefore, not so rapid as might otherwise be the case. The same reasons prevent a more extensive thinning of young growth than is taking place. The question is, however, not lost sight of, nor is the removal of creepers and climbers which in some forests are pests of considerable importance. Attention to their removal has had, however, the most beneficial effect in many valuable forests; but it is beyond doubt that the attention must be constant, as it seems impossible to permanently eradicate the evil. Experience of late years has shown that greater attention to the weeding of young growth, especially in *taungyas* and other cultural operations, is more necessary than was at first supposed. More care has accordingly been taken, and the results have more than repaid the outlay.

CHAPTER III.

WORKING AND OUTTURN.

The following table is compiled from provincial returns and exhibits the outturn for 15 months (1st April 1892 to 30th June 1893) from the various classes of forests in so far as this is traceable from the forms submitted to the Government of India. The table is far from accurate, and cannot become so until full book-credit is given for all forest-produce extracted under rights, privileges, and free grants, and for provincial Government purposes.

PROVINCES.	Reserved Forests.			Protected Forests.			Unclassed Forests.			Average outturn per square mile. Reserved Forests.			Protected Forests.			Unclassed Forests.		
	Timber and fuel.	Bamboos.	Minor produce.	Timber and fuel.	Bamboos.	Minor produce.	Timber and fuel.	Bamboos.	Minor produce.	Timber and fuel.	Bamboos.	Minor produce.	Timber and fuel.	Bamboos.	Minor produce.	Timber and fuel.	Bamboos.	Minor produce.
	C. feet.	No.	R.	C. feet.	No.	R	C. feet.	No.	R	C. feet	No.	R	C. feet	No.	R	C. feet	No.	R
Bengal	29,699,661	6,977,248	97,613	16,988,432	4,016,870	157,195	1,110,351	10,687,482	12,991	3,454	1,323	17	5,532	1,308	51	275	2,649	3
N.-W. P. and Oudh	15,923,931	21,188,968	341,245	878,393	258,653	11,631	160,523	1,184,807	5,134	4,254	5,659	91	9,345	2,758	124	3,276	24,180	105
Punjab	4,390,538	887,065	147,701	1,779,264	...	89,690	30,606,418	48,473	301,127	2,515	335	86	8,941	...	452	7,452	12	73
Central Provinces (a)	12,651,889	22,249,528	475,037	...	...	...	...	...	...	645	1,134	24	...	...	...	...	...	...
Burma (Lower)	2,112,157	4,610,400	33,392	...	...	...	15,984,462	44,568,799 (b)	56,563	...	...	...	...	...	...	Area	not k	nown
Burma (Upper)	625,818	...	...	16,257,235	...	...	...	21,683,861	343,345	...	...	...	...	...	...	...	...	...
Assam	1,354,424	1,549,743	6,286	...	...	... (c)	4,658,130	5,817,487	55,336	374	427	2	...	...	...	652	815	8
Coorg	211,855	2,200	6,567	351,356	315,572	29,670	...	...	...	...	...	...	...	...	...	...	...	...
Ajmere	281,656	12,996	77,351	...	...	...	...	...	...	2,026	93	556	...	...	...	...	...	...
Baluchistan	(d) 537,172	...	3,591	...	...	...	...	...	...	5,068	...	34	...	...	...	...	...	...
Andamans	188,010	...	...	...	...	...	1,890,448	873,162	3,653	7,834	...	...	...	...	...	978	482	2
Berar	2,167,101	4,362,301	82,753	...	...	...	...	...	...	511	1,030	19	...	...	...	...	...	...
Madras (e)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bombay (f)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	—	...	...	...

(a) From reserved forests only in the case of timber, fuel and bamboos; from total forest area in the case of minor produce.
(b) Class of forests from which these bamboos were extracted is not mentioned in the Report.
(c) Includes R28,029 on account of cardamoms.
(d) Of this, 520,933 cubic feet were removed from Unclassed Forests.
(e) The forests in the Madras Presidency yielded 15,105,121 cubic feet of timber and fuel, 20,779,393 bamboos, and R3,03,255 worth of minor produce. Dividing these figures by the 17,187 square miles under the Forest Department, a proportion is obtained of 878 cubic feet of timber and fuel, 1,209 bamboos, and R47 worth of minor produce per square mile respectively.
(f) The outturn of the forests in the Bombay Presidency amounted to 44,263,509 cubic feet of timber and fuel (exclusive of 76 khandis, 131 trees, and 53 pieces of sandalwood, the cubic contents of which are not given); 11,143,936 (besides 10,519 cart-loads, 11,030 head-loads, 2,859 ganjas, 37,500 paramas, and 1,564 pipes) bamboos, and R7,86,574 worth of minor produce. Dividing these figures by the 14,510 square miles under the Forest Department, a proportion is obtained of 2,012 cubic feet of timber and fuel, 768 bamboos, and R54 worth of minor produce per square mile, respectively (not taking into account the sandalwood and cart-loads and head-loads of bamboos above mentioned).

I am entirely in favour of diverting a considerable amount of the material produced in the State forests, and even of the revenue, to local purposes; but consider it advisable that a much more accurate account should be kept of such transactions than has been customary in several provinces.

The outturn per square mile of forest reserves varies considerably. In some instances this is due to a lack of supply in mature timber, as for instance in the more accessible sal forests in Bengal which were too heavily worked some years ago and which require time to recover; in others the want of demand prevents a complete utilization of the material, as in the majority of the Central Provinces forests.

The following table is interesting as showing the agency by which the revenue-paying outturn of the forests is brought to market:—

Provinces.	Timber (cubic feet).		Fuel (cubic feet).		Bamboos (No.)		Minor Produce.	
	Removed by Government.	Removed by purchasers.	Removed by Government.	Removed by purchasers.	Removed by Government.	Removed by purchasers.	Removed by Government.	Removed by purchasers.
							R	R
Bengal . . .	22,684	8,179,773	131,503	26 914,794	4,682	21,673,918	27	2,64,334
N.-W. P. and Oudh.	733,957	2,977,550	4,410,550	2,912,872	502,229	21,905,368	40,450	2,49,545
Punjab . . .	889,871	500,477	2,609,258	1,127,127	629,791	5,749	859	2,68,909
Central Provinces .	313,723	1,974,588	1,136,759	9,226,819	145,245	22,104,283	38,063	4,36,974
Burma (Lower) .	2,897,005	10,171,435	...	4,976,676	...	22,450,557	...	89,951
Burma (Upper) .	171,114	12,482,048	...	3,659,723	...	21,683,861	832	3,42,513
Assam . . .	68,035	2,413,717	1,286	446,440	1,870	4,494,617	1,648	53,298
Coorg . . .	57,956	267,869	...	220,900	2,200	360,272	2,331	29,670
Ajmere . . .	...	10,492	...	266,695	...	12,996	...	3,637
Baluchistan . .	355	4,226	8,927	523,664	...	...	1,289	1,487
Andamans . .	414,963	60,664	...	1,152,106	...	248,162	...	2,831
Total .	5,569,663	39,042,839	8,298,283	51,427,816	1,286,017	114,948,783	85,499	17,43,149
Berar . . .	...	650,570	...	1,509,243	...	4,359,811	...	82,541
Total Bengal Presidency . . .	5,569,663	39,693,409	8,298,283	52,937,059	1,286,017	119,308,594	85,499	18,25,690
Madras . . .	292,300	2,634,450	2,038,099	10,098,923	34,039	20,652,606	48,951	7,54,097
Bombay . . .	1,818,657	4,362,338	20,588,519	12,803,917	3,025	11,012,985	1,18,159	6,68,091
Grand Total .	7,680,620	46,690,197	30,924,901	75,839,899	1,323,081	150,974,185	2,52,609	32,47,878

Bengal.—The exploitation of timber is regulated by selection fellings, limited by girth and by sylvicultural rules; while fuel is extracted under improvement fellings without limit of area. In the Sundarbans forests, which are henceforth to be managed under a regular working-plan as previously mentioned, the fellings were unregulated and extended over the whole area, reserved and protected. During the fifteen months under review, the total outturn of timber was 81 lakhs cubic feet, and of fuel (excluding the uncertain quantities removed by privileged persons) nearly 147 lakhs. The corresponding results for the preceding 12 months were 72½ lakhs and 144 lakhs. Taking into account the extra period of three months covered by the returns, it will be seen that the exports of timber and fuel decreased respectively by 11 per cent. and 18 per cent. The number of bamboos cut was also materially reduced. This decline in the export of produce was occasioned, partly by a change of system and a trade movement in the Sundarbans, and partly by the policy of favouring the extraction of forest-produce, generally in the Circle, by private agency. There is, however, no reason to suppose that the disturbing causes will have other than a temporary and passing effect.

North-Western Provinces and Oudh.—The continued construction of railways much facilitated the exploitation of forest-produce in the Oudh Circle, where removal and conversion are conducted by purchasers, except as regards the disposal of fuel, which does not as yet attract private enterprise. The total removals of timber and fuel, including wood extracted by right-holders and free grantees, were respectively 61,89,000 cubic feet and 1,07,74,000 cubic feet. The corresponding amounts for the preceding period of twelve months were 42 lakhs and 76¾ lakhs. The value of minor produce removed was R5,32,169, as against R4,69,610 in 1891-92. The outturn by Government agency in the case of timber increased from 5,74,000 to 7,34,000 cubic feet, while the departmental working of fuel was, owing to extensive operations in Oudh, more than doubled. It will be seen from the table prefixed to these remarks that the average outturn of timber and fuel per square mile of reserved as well as of protected forest is higher than in any other circles.

Punjab.—The Conservator's administration report includes an interesting account of the general manner in which the forests are exploited and of the work done in the extraction and disposal of forest-produce. During the 15 months ending 30th June 1893, there were removed from the forests 23¼ lakhs and 344½ lakhs cubic feet of timber and fuel, respectively, as well as minor forest-produce to the value of 5¼ lakhs of rupees The

outturn of timber and fuel per square mile, according to the above table, was 2,515 cubic feet for reserved and 8,945 for protected forest. These figures, however, are the actuals for 15 months, and include rough estimates of large quantities of produce removed free of payment. By comparing outturn for the financial years 1891-92 and 1892-93, it will be seen that, during the latter period, the quantity of timber and fuel removed by Government agency decreased by 1,64,000 cubic feet, while the decline in the amount removed by purchasers, *viz.*, 4,05,000 cubic feet, was still more marked. The reasons for these variations are not altogether apparent from the Conservator's report.

Central Provinces.—With the exception of minor produce, which showed a considerable decrease owing to a fall in the price of myrabolams, the outturn of forest-produce of all kinds was considerably increased, independently of the fact that the report embraces a period of 15 instead of as usual 12 months. The exports of timber increased from 17½ lakhs cubic feet to nearly 23 lakhs, while the outturn of fuel rose from 67½ to 103½ lakhs. In minor produce there was a decline in receipts of more than 6 lakhs of rupees. The average outturn of timber and fuel per square mile was increased from 433 cubic feet to 645 cubic feet.

Burma.—In Lower Burma the girdling operations included the ringing of 21,400 teak trees, and 38½ lakhs cubic feet of teak timber were extracted from the forests during the period under review. In Tenasserim, over 5½ lakhs cubic feet of teak were exploited, and the balance was removed from the Pegu Circle forests. Of woods of other kinds, 9¼ lakhs cubic feet were extracted, the output having been on the average considerably less per month than for the previous financial year. The falling off was mainly due to a decrease in the extractions of Kanyin timber, attributed to an increase of the duty on this species. A considerable increase of exports, notably of that of teak, occurred however in the Pegu Circle. The outturn of teak was 11½ lakhs cubic feet, as against 5½ lakhs in 1891-92. The quantity of timber, almost entirely teak, extracted by Government agency in this circle, was 21 lakhs cubic feet, while purchasers removed upwards of 79 lakhs cubic feet. In Lower Burma generally there was an enormous increase in the export of bamboos and canes, due to the imposition of a duty in the latter part of 1891-92. The total number, as shown by the returns, amounted to 49 millions.

In Upper Burma, 17,140 teak trees were girdled. Of timber of all kinds extracted by the various agencies, 131¾ lakhs cubic feet were removed, as compared with 73½ lakhs in the preceding 12 months. In the Eastern Circle, 32,238 cubic feet were removed by Government agency and 96,722 tons by lessees. Government worked out no timber in the Western Circle, but the Bombay-Burma Trading Corporation removed 38,082 tons.

For the whole province the quantities of timber and fuel removed during the year were, respectively, 263 lakhs cubic feet and 87 lakhs cubic feet.

Assam.—The working of the local Forest Department under this head furnished satisfactory indications of present and prospective development. The total outturn of timber from Government forests increased from 48½ to 60 lakhs cubic feet. The increase of a million cubic feet in the outturn of fuel (18 to 28 lakhs) points to an increased demand on the Government forests. In only two divisions did the outturn of produce decrease, and the decline, ascribed to slackness of trade, would, it was stated, not be of a permanent nature.

Coorg.—Bearing in mind that the period under report extended over fifteen, instead of, as usual, twelve months, the quantity of produce removed under all heads was considerably less than during 1891-92; but the falling-off is ascribed in part to the presence of cholera. When reviewing the Deputy Conservator's Report, the Government of India observed that the anticipated decline in the outturn of sandalwood is a question for careful investigation, and that the exploitation of this product should be placed, as soon as possible, under a working-scheme which would extend over a term of years. The total outturn of timber was nearly 3½ lakhs cubic feet, or more than half a lakh less than in the preceding period of twelve months. Of sandalwood, 189 tons were collected at a cost of R30 per ton.

Ajmere.—There was a marked improvement under all heads as compared with the returns for 1891-92. Of timber 14,161 cubic feet, of fuel 2¾ lakhs cubic feet, and minor produce to the value of R77,617 were removed from the forests. Owing to a favourable season, it was found possible to revert to the previous practice of restricting grazing and cutting and storing grass-fodder. In consequence, the quantity of cut fodder, removed free of payment, increased from 324,000 to 1,093,000 bundles.

Baluchistan.—The total outturn of timber and fuel amounted to 5,37,172 cubic feet, of which only 4,000 cubic feet were on account of timber. Four times as much fuel were removed by purchasers as in the preceding financial year.

Andamans.—The total quantity of wood extracted was: timber 5,13,127 cubic feet; fuel 15,65,331 cubic feet. Allowing for the additional period of three months involved, the quantities of timber and fuel removed showed a satisfactory increase as compared with the returns for 1891-92. Two cargoes of padouk timber were shipped for the London market; but, owing partly to the comparative inferiority of one of the cargoes, the prices realized were not as favourable as might have been expected. In reviewing the administration, the Government of India remarked that the exceptional qualities of padouk have not been sufficiently made known in the timber-trade, while the Australian hardwoods, jarrah and karri, have been extensively advertized. Larger and better sales will probably be effected hereafter; but it should be the aim of the local forest department to dispose of as much as possible of forest-produce of all kinds in the Settlement itself.

Berar.—Owing to various causes, amongst others unseasonable weather and administrative changes, the quantity of produce removed from the forests was considerably decreased, and the demand was slack in most divisions. During the period of fifteen months under notice, 6½ lakhs cubic feet of timber and 15 lakhs of fuel were removed, the corresponding figures for the preceding financial year having been respectively 5¼ and 15½ lakhs. The quantities of bamboos cut, and the value of grazing and grass removed, remained almost unaltered.

Madras.—The quantity of timber, including sandalwood, removed from the forests during the fifteen months, was 29¾ lakhs cubic feet, or more than one lakh less than during the preceding period of twelve months. In fuel export there was also a considerable decline, *viz.*, from 140 lakhs to 121 lakhs cubic feet. The decline in the outturn of bamboos was even more marked, and though the value of minor produce removed (R8,03,255) was considerably in excess of that for 1891-92, the average monthly value realized remained the same. The yield-comparisons in chapter V of the Board of Revenue's Report are misleading, as the statistics relate to 15 and not, as might be supposed from the Report, to 12 months. Although the average quantities of timber, fuel and bamboos removed from the forests monthly in 1892-93, declined respectively by 23, 31 and 47 per cent., yet apparently no adequate explanation of the decrease has been recorded. There was once more a considerable diminution in the quantity of timber worked out departmentally, although it would seem that the number of trees fe lled by the department was very largely increased. The cost of collection by Government agency was, for reasons not indicated in the Report, very largely increased. Although much less produce was removed directly by purchasers, the value of the produce so r emoved was considerably augmented, a fact ascribed, curiously enough, to an increase in demand caused by favourable weather. It may be hoped that in future reports the reasons for the variations in the outturn from year to year may be recorded.

Bombay.—The total quantities of timber and fuel removed from the four circles were respectively 63¾ lakhs cubic feet and 359 lakhs cubic feet, or on an average 2,912 cubic feet per square mile of forest. The totals of the previous return were timber 53½ lakhs and fuel 307 lakhs. Full details of these figures are ascertainable from the circle reports.

CHAPTER IV.

FINANCIAL RESULTS.

The following table exhibits the figures for gross and net revenue in the various provinces, as compared with the average figures for the five years ending with 1891-92.

Province.	Revenue.		Surplus.		Deficit.		Proportion of Surplus to Gross Revenue (1892-93).	Net Revenue per square mile of land under control of Forest Department (1892-93).
	1892-93.	Average for preceding 5 years (1887-88 to 1891-92).	1892-93.	Average for preceding 5 years (1887-88 to 1891-92).	1892-93.	Average for preceding 5 years (1887-88 to 1891-92).		
	R	R	R	R	R	R	Per cent.	R
Imperial	5,240	5,336	...	...	1,02,030	74,131	...	...
Bengal	7,44,880	7,24,073	3,63,270	3,23,728	...	...	49	28
North-Western Provinces and Oudh.	16,52,540	15,58,762	7,24,000	6,55,592	...	...	44	187
Punjab	8,12,630	9,21,772	1,56,360	2,79,579	...	...	19	26
Central Provinces	12,30,850	12,00,663	3,79,450	5,09,153	...	...	31	19
Burma (Lower)	35,83,370	26,99,741	22,20,020	14,97,925	...	...	62	383
Burma (Upper)	20,76,630	13,30,894	16,34,880	9,59,643	...	...	79	61
Assam	3,82,830	3,22,723	1,18,760	73,662	...	...	31	10
Coorg	1,80,680	1,34,884	1,07,590	59,304	...	...	60	120
Ajmere	14,890	14,905	...	(a)1,672	110	(b)1,563	...	...
Baluchistan	19,030	13,992	...	...	36,590	8,339	...	...
Andamans	3,66,490	1,60,599	1,29,280	55,617	...	...	36	66
Forest School	1,980	1,087	...	...	48,420	33,968	...	...
Forest Surveys (Imperial)	520	587	...	...	21,640	24,898	...	...
TOTAL	1,10,66,560	90,90,018	56,24,820	42,72,976	...	...	51	63
Berar	4,31,020	4,50,652	2,01,790	2,71,089	...	...	47	48
Forest Surveys (Berar)	...	...	...	...	...	(c)14,384	...	...
TOTAL BENGAL PRESIDENCY.	1,14,97,580	95,40,789	58,26,610	45,29,681	...	...	50	62
Madras	15,77,210	15,87,435	2,46,820	3,70,953	...	...	16	14
Bombay	32,69,550	31,18,666	13,64,580	12,76,666	...	...	42	94
GRAND TOTAL	1,63,44,340	1,42,46,891	74,38,010	61,77,300	...	...	46	59

A comparison of the gross revenue with expenditure for periods of five years since 1867-68 is exhibited in the following table, from which it will be seen that the percentage of expenditure has continuously decreased :—

Quinquennial periods.	Gross Revenue.	Expenditure.	Proportion of Expenditure to Gross Revenue.
	R	R	Per cent.
1867-68 to 1871-72	46,34,453	32,95,160	71
1872-73 to 1876-77	65,38,373	44,09,179	67
1877-78 to 1881-82	73,80,431	49,41,212	67
1882-83 to 1886-87	1,06,78,807	68,31,284	64
1887-88 to 1891-92	1,42,46,891	80,69,590	57

It will be seen from the table below that the percentage of expenditure to gross revenue, which during the five quinquennial periods from 1867 to 1892 amounted to 63 per cent., has again decreased, in spite of the costly reorganisation of the Superior Staff. There is a certain point of safety below which this percentage should not be allowed to drop; and in my opinion this point has been passed.

In consideration of the future we spend too little on A (*a*) (ii) and (iii)—Subordinate Staff and Office Establishments, especially the former—as well as on A (*b*) (2)—Roads and Buildings :—

		Amount. R
Gross receipts	(*a*) Wood	1,23,78,880
	(*b*) Minor forest-produce	13,65,910
	(*c*) Grazing	18,02,970
	(*d*) Revenue from forests not managed by Government	3,85,690
	(*e*) Miscellaneous	4,10,890
	TOTAL REVENUE	1,63,44,340

				Amount. R	Proportion of Expenditure to gross Revenue. Per cent.
Expenditure	A. Recurring.	(*a*) Administration.	(i) Superior Staff	20,29,230	12·42
			(ii) Subordinate Staff (including Rangers, Foresters and Guards).	12,67,346	7·75
			(iii) Office Establishments (including Contingencies).	6,59,780	4·04
		(*b*) Working	(1) Extraction	26,79,680	16·40
			(2) Roads and Buildings	3,78,550	2·32
			(3) Fire-protection	2,38,640	1·46
			(4) Cultural operations	3,38,970	2·07
			(5) Live-stock, stores and plant	2,43,000	1·49
			(6) Working-plans	46,910	0·29
			(7) Rent for leased forests	1,37,400	0.84
			(8) Miscellaneous (including Home charges).	1,19,950	0·73
		(*c*) Expenditure on realizatoin of revenue from forests not managed by Government.		20,340	0·12
		(*d*) Forest Science and Education (including all "A" and "B" charges of Forest School).		95,054	0·58
			TOTAL	82,54,850	50·51
	B. Extraordinary.	(*e*) Forest Settlements (including compensation)		85,540	0·52
		(*f*) Forest Surveys		4,24,230	2·60
		(*g*) Forest Demarcation		1,41,610	0·86
			TOTAL	6,51,380	3·98
			GRAND TOTAL EXPENDITURE	89,06,230	54·49
			Net Revenue	74,38,110	45·51
					100

Bengal.—The general financial results may be considered satisfactory. The receipts during the period of 15 months in question amounted to a little more than 9 lakhs, the charges to 4¾ lakhs, and the net revenue to nearly 4⅓ lakhs. In the financial year the receipts, charges and surplus, were, respectively, R7,44,880, R3,81,610 and R3,63,270. As compared with the preceding year the revenue was R44,673 less; but as the charges were correspondingly lessened, the surplus, which amounted to 49 per cent. of the gross receipts, remained almost unaltered. The revenue, which is derived mainly from timber, fuel and minor forest-produce, declined under every main head except those of bamboos and confiscated material. Nevertheless the financial results compare favourably with those for the quinquennial period ending with 1891-92. The diminution in revenue from timber was insignificant, while the causes of the decrease under fuel have already been explained in the remarks concerning exploitation and outturn.

North-Western Provinces and Oudh.—The receipts, charges and surplus were respectively R16,52,540, R9,28,540 and R7,24,000, the last figure being 44 per cent. of

the gross revenue. The revenue was abnormally high in Oudh owing partly to the sale during the year of timber in stock of the value of 2 lakhs of rupees. In the Central Circle, the surplus exceeded that of 1891-92. Taking the three circles together, both the gross and net revenues were slightly reduced, as compared with the results obtained in the preceding financial year; but the surplus was considerably in excess (R68,400) of the average figure for the half-decade ending 1891-92, and for the Oudh Circle, where it amounted to R4,37,473, was the largest hitherto obtained. The total results would have been the most favourable on record had it not been for the deferred adjustment of a considerable item of revenue (R85,000) which should have been credited in the accounts of the year.

Punjab.—The results for the financial year were: receipts, R8,12,630; charges, R6,56,270; surplus, R1,56,360. These figures cannot be considered satisfactory bearing in mind past results. It is true that, as explained in the Review for 1891-92, the gross and net revenues in that year were exceptionally high; but the receipts in the year under notice were the lowest obtained since 1887-88. The decline is ascribed to dullness in the timber trade and to the consequent withdrawal from sale of large stocks. Other causes contributed to a diminution of sales derived from bamboos, grazing and miscellaneous produce. The Conservator in his Report took a gloomy view of prospective financial results; but the Government of India, in reviewing the subject, pointed out that the utilization of material from Government forests might be expected to increase owing to a probable restriction of supplies from foreign sources.

Central Provinces.—The receipts and charges were respectively R12,30,850 and R8,51,400, and the surplus was R1,76,500 less than in the previous year. In both circles the receipts diminished. In the Northern Circle, the decline was attributed to the new grazing rules, and to the fact that no timber was exploited departmentally; while, in the Southern Circle, purchasers did not come forward so readily owing to the belief that rates for forest produce would be further lowered. Inclement weather and cholera in certain districts also helped to swell the decrease.

Burma.—In *Lower Burma*, during the period of 15 months under review, the gross revenue and expenditure were respectively R41,43,000 and R15,13,000. In the financial year the results were: revenue, R35,83,370; expenditure, R13,63,250; surplus, R22,20,120. As compared with the preceding year the revenue in Tenasserim rose by 1½ lakhs owing to the higher price of teak, the enhancement of duty on *thingan* and to larger realizations from the Kado 7 per cent. *ad valorem* duty. The Pegu Circle receipts rose by R5,80,000, owing to larger disposals of timber extracted departmentally and by lessees. In both circles the rise in expenditure, *viz.*, from R13,25,100 to R13,63,200, was satisfactorily small as compared with the increase of revenue. The proportion of net to gross revenue was 62 per cent.

In *Upper Burma* the actuals of the year were as follows: receipts, R20,76,630; charges, R4,41,750; surplus, R16,34,880.

Taking the circles as a whole, the results were the best on record. The gross revenue of R56,60,000 exceeded that of the preceding year by 14¾ lakhs; and it is note worthy that the net receipts, or R38,55,000 amounted to 52 per cent. of the total surplus for the Empire.

Assam.—The financial results were again very satisfactory. A substantial increase of revenue occurred under every head, and the proportion of net to gross receipts rose from 20 to 31. The cutch revenue, referred to in the last Review, was successfully collected, and realized R49,600. The total gross receipts amounted to R3,82,830, the charges were R2,64,070, and the surplus R1,18,760.

Coorg.—Although the receipts (R1,80,680) as compared with those of 1891-92 slightly declined, the surplus (R1,07,590), owing to diminished expenditure, showed a material increase. The revenue from sandalwood and cardamoms is expected to fall; but an enhancement of income may be anticipated from the ghât forests and other sources, as well as from the development of export roads of which the necessity is urgent. With reference to the remarks in the Review for 1891-92 regarding sandalwood, the cost of collection during 1892-93 was reduced from R35 to R30 per ton, while the sale-price rose from R413 to R448.

Ajmere.—The results (receipts, R14,890, charges R15,000) were not so favourable as in 1891-92, owing mainly to a decline in the revenue from grazing caused by a good grass crop outside forest limits. Right-holders enjoyed free of cost forest-produce to the estimated value of R69,000.

Baluchistan.—The revenue and expenditure were respectively R19,030 and R55,620 These results show a slight decline in receipts and a large increase in charges, as compared with those of the preceding year. The former is ascribed to the severe winter and to the purchase of fuel by Government in Sind instead of in the local market. These reasons are, however, inadequate; since nearly four times as much fuel was removed from the forests by purchasers as during the preceding 12 months. The rise in the charges is on account of the Shebo plantation, transferred during the year from the Military to the Forest Department.

Andamans.—The results were very satisfactory. The revenue for the financial year (R3,60,490) was the highest on record, and the surplus (R1,29,280) may be expected to increase considerably in the near future in consequence of better prices for padauk being realized in London, and as a result of greater facilities for the export of this species.

Berar.—The financial results were seriously affected by the causes already mentioned which diminished the outturn of forest-produce. The receipts (R4,31,020) were less than those of 1891-92 by R80,165, and the surplus was reduced from R3,12,819 to R2,01,790. Neglecting the extra period of three months involved, the revenue declined under every head; but there was no reason to suppose that the disturbing causes would unfavourably affect the revenue in future years.

Madras.—The total revenue for the financial year amounted to R15,77,210 as against R16,94,216 in the previous year. The decline of R1,17,006 is attributed to general scarcity in Kurnool, to the failure of the cardamom crop in Coimbatore, and to short removals and less demand for produce in various districts The charges were R13,30,390 as compared with R13,24,254 in 1891-92. The net surplus was about 2½ lakhs; but, for the whole period of 15 months, was more than 3½ lakhs. There was a large deficit in the Southern Circle. The total net receipts amounted to only 16 per cent. of the gross revenue.

Bombay.—The total revenue (R32,69,550) was R15,000 less, the gross charges about R26,000 less and the net surplus R11,000 more than for the preceding financial year. In the Central Circle, although the receipts rose by three-fourths of a lakh, the charges increased by R1,13,000, so that the surplus declined by R38,000. The enhanced charges were caused by increased felling operations and to a rise in the expenditure on salaries. Owing to a more favourable market and to diminished charges on conservancy and works in the Southern Circle, the receipts and surplus rose respectively by R53,000 and R84,000. An abnormal rainfall and heavy floods in Sind contributed to a decline of the net revenue in that circle of R26,000.

CHAPTER V.

I.—ESTABLISHMENTS.

No further progress was made in the reorganization of the Forest Staff. The organization of the controlling staff may, excepting Burma where nine or ten additional officers are urgently required, be considered to meet the demands fairly well for some years to come. The subordinate service, however, especially the ranger class, is greatly under-manned in all provinces.

It is evident that this condition of affairs hampers progress ; for it is the ranger class which forms and must form the mainstay of any sound forest administration. Every Local Government takes this view and has done so for years past, and the demands for an increase of the subordinate staff are both frequent and urgent. The Government of India have fully recognised that a thorough reorganization of the staff, of Rangers, Foresters, and Forest Guards, is necessary for administrative as well as for financial reasons, and have recommended a considerable, though under the circumstances moderate, increase of the subordinate staff in all its branches ; but, owing to the financial conditions of the country, the proposals have, for the time being, been negatived by the Home authorities. The steady growth of the forest administration in general importance and the constantly increasing revenue, render, in my opinion, the increase advisable, and even imperative in consideration of the enormous capital represented by India's State forests which must suffer if the administrative agency is not strengthened. The clerical staff also requires a considerable increase, but this is not of the same vital importance.

The necessity of the reorganization, still under consideration, was first recognised in 1886.

II.—EXPERIMENTS.

Experiments conducted by the Forest Department have hitherto had in view to a large extent such measures as the introduction of exotic species, etc., rather than the utilisation of existing forest-products. Of late years, however, the more practical issue has begun to receive special attention, and it is being realised that many of our timbers can hold their own against the finest produced in other countries, and may be expected to find a ready sale in the great markets of Europe, if not of America. Special experiments, investigations and measures are now being systematically carried on or brought into effect with a view of making known in India and in Europe certain of our most valuable products, and of developing existing or creating new markets. In connection with analysis and pure experiment, the services of the Agricultural Chemist and of his Assistant at Dehra Dun have recently been made available, while the Forest Department, acting in conjunction with the Reporter on Economic Products, collects specimens of timbers, etc., samples of which are sent to the Imperial Institute in London for purposes of enquiry and examination. Full particulars of all products collected are published in India, either in the Agricultural Ledger Series or in the *Indian Forester*, and in England in the Institute Handbooks. Of timbers alone, it has been arranged that two species will be yearly

selected by the Forest Department for exhibition at the Institute; and it is hoped that the valuable qualities of some of our best woods may become in this manner more widely known and appreciated. It is confidently expected that some of our finest timbers will soon be required in large quantities for street-paving in Europe, as well as for supplying certain special demands, *e. g.*, wood for rifle stocks, in suitably meeting which some difficulty is experienced.

The following jottings, culled from the several administration reports, summarise the information recorded under this head :—

Bengal.—In the Ranjit valley (Darjeeling Division) 18 acres were planted up with *Caryota urens* palms, and in Tista plants derived from imported seed of the English oak (*Q. pedunculata*) were reported as thriving.

North-Western Provinces and Oudh.—The cultivation of lac was under trial in the School Circle, and the experimental planting of date palms in Bundelkhund was favourably reported on. Of exotics, *Cryptomina japonica* and *Pinus khasya* were doing well at Chakhrata, and *Robinia pseudo acacia* at Naini Tal. Further experiments with a view to determine the yield of cutch from khair were continued in the Central Circle, but yielded no useful results.

Punjab.—The Conservator's report contains a full and interesting account of the further attempts made to introduce and propagate the exotic species of *Robinia* and *Albizzia*, referred to in the last Review. The results of the year showed a decided improvement on those obtained in 1891-92. The Government of India have specially noticed the value of the fast-growing *Robinia*, and have remarked on the interest which attends its introduction into the Punjab. Other experiments were unimportant. In Bashahr the cultivation and free distribution of considerable numbers of Spanish chestnuts was continued, and in Changa Manga trials were conducted for the propagation of the better fodder-grasses.

Central Provinces.—The sandalwood cultivation in Chanda, referred to in the Review for 1891-92, having proved successful, was extended, and some hundreds of young plants were put out in various ranges. The Conservator reported that, provided proper protection is afforded, the species propagates itself freely. Another experiment was started with a view to ascertaining whether the reproduction of *Tendu* by root-suckers could not be facilitated by stubbing out the stool and by tapping the roots. The results were not ascertained during the year. For the Northern Circle, as in previous years, nothing is recorded under this head.

Burma.—From the Tenasserim Circle it is reported that the plants of *Hevea braziliensis* continue to do well, that young plants are springing up, and that it is only now a matter of time for the trees to become mature and fit for tapping. The Conservator adds that the question of extending this experiment will have to be considered. In the Eastern Circle of Upper Burma R4,109 were expended on the up-keep of orchards and experimental plantations. It is stated that the para rubber trees at Bhamo continue to do well, and details are given by the Conservator regarding the cultivation of other exotics.

In *Assam, Coorg, and Ajmere* no noteworthy experiments were conducted.

Baluchistan.—Of all the species of which the introduction has been attempted the *Robinia* appears to promise the best results. Eucalyptus will not stand the winter at Quetta, but *Cupressus torulosa* does well and will be largely cultivated. The horse and sweet chestnuts and *pistachio vera* also succeed.

Berar.—Certain experiments in the cultivation of the date-palm were in progress, but the results are not readily ascertainable from the report.

Madras.—The appendix to the report compiled by the Board of Revenue contains notes regarding experiments with exotics, such as the mahogany, date-palm, etc.; but the results have not been generalized, nor has the desirability of continuing or extending work under this head been commented upon.

Bombay.—The various circle reports contain information regarding experiments carried out with exotic and other forest species, but apparently nothing of much interest or importance was done.

III.—Exports of Forest Produce.

The following table shows the sea-borne exports of forest produce from India to foreign countries during 1892-93:—

Articles.	Quantity in tons of 20 cwt.; in the case of Teak, cubic tons.		Valuation at port of shipment in 1892-93.	
	Average of five years, 1887-89 to 1891-92.	In 1892-93.	Total.	Per ton.
			R	R
Caoutchouc	463	499	13,07,819	2,621
Shell-lac	4,983	5,103	64,38,513	1,261
Lac-dye	12	12	10,090	841
Sandalwood, ebony, and other ornamental woods	Information not available.		6,92,585	...
Cutch and gambier	11,395	11,466	38,24,840	334
Myrabolams	35,360	33,377	33,67,093	100
Teak	51,078	58,350	57,01,024	98
Cardamoms	101	136	2,96,969	2,184
Total in 1892-93	...	...	2,16,38,933	...
Total in 1891-92	...	...	2,02,62,100	...
Increase in 1892-93	...	...	13,76 833	...

IV.—Technical Education and Recruitment.

The number of officers of the Indian Forest Service was 182, of which 110, or 60·4 per cent., had undergone special training in European forest schools. Owing to a change in the curriculum of studies at the Coopers Hill College, under which the period of instruction was extended from two to three years, no recruits for the Forest Service arrived in India during the period under review. The prolongation of the technical course was accompanied by modifications in the system of instruction involved by the decision that the inclusion in the competitive tests for admission to the College of certain special subjects, not usually taught at the schools, injuriously affected both the number and the quality of candidates presenting themselves at the entrance examination. The preliminary tests have accordingly been reduced from 17 compulsory to 3 compulsory and 4 optional, the main object being "to secure a youth who has had a thoroughly well-grounded liberal education as an English gentleman." To this general standard there can be no objection, provided at the same time the youths selected are fitted by inclination, habits and physique for the very special service they are called upon to carry out in this country. The examination, however, admits young men who know nothing of the special subjects upon which the science of forestry is based, and who, for a considerable portion of their time at Coopers Hill, have to be taught elementary botany, geology, chemistry and physics—subjects which they have not previously studied, and for which they may possess no special natural aptitude. While it is as yet too early to express a confident opinion, there is some reason to think that the change in the entrance examination is not conducive to the selection of candidates best qualified, from the educational standpoint, for the Forest Service of this country. Moreover, careful selection of candidates will in future be all the more desirable in consequence of the impending reduction of the cadre of the Imperial Service following upon the creation of provincial forest services recruited in India. For some years to come the home recruitment is to be restricted to about 6, instead of about 10,

officers annually. If the Imperial Service is to be maintained as a scientific *corps d'élite*, it seems probable that candidates for entry must be required to prove their eligibility otherwise than by indicating their proficiency in the dead languages and by passing easy tests in the only obligatory subjects, English composition, lower mathematics and German.

While, however, the acquisition at Coopers Hill College of a good groundwork of forest knowledge, based on scientific principles applied in the highly organized forests of Germany and France, is essential, the knowledge so gained must be adapted to the varying requirements of India in a wider and more liberal spirit than is necessary or desirable in the long-established forest administrations of the West. Forest officers, after some years of practical work in India, are in a position to assimilate, as it were, such branches of continental practice as are more immediately applicable in the provinces where they are employed. It is therefore very satisfactory that Government has recently sanctioned the grant of facilities by which selected officers, who have done good work in this country, can renew, while on furlough in Europe, their forest studies. The concession has already been freely made use of with, as I am in a position to say, fruitful results.

The Imperial Forest School at Dehra Dun was attended during the year by 102 students, of whom 70 were already in Government service, or were afforded assistance by Government, while 10 were deputed by Native States and 22 were private students. At the final examinations, held in March 1893, 34 students were awarded certificates by the higher standard, while four passed the forester's examination. The total expenditure, during the fifteen months ending 30th June 1893, amounted to R64,227 as against R44,337 in the preceding financial year.

The School was successfully administered during the year and the staff of officers deserve commendation for their continued efforts to secure the acquisition by the students of practical knowledge and the failure of "cramming" propensities. The final examinations were conducted under the supervision of the School Board of Visitors, which drew up rules for the management of the Institution and for the admission of students. An important feature of these rules, which have since been approved by Government, is that candidates should ordinarily be admitted as private students, and that the best men would *cæteris paribus* secure appointments under Government only on their successfully passing out of the School. The School is now utilized by Ceylon and by every local administration in India except the Government of Bombay, from which province, however, students come to the School in their private capacity and without any official support.

If the reorganisation of the Ranger's class is further delayed, it will become necessary to consider whether a reduction in the number of students at Dehra is not advisable, as the present sanctioned scale of appointments does not provide employment for the numbers now educated.

V.—Forest Administration in Native States.

Mysore, Kashmir, Indore, the Simla Hill States, Jeypur, Jodhpur and Marwar maintain organized forest services, and issue annual progress reports which show that, considering the circumstances, progress is being made in the right direction.

The forest administration in Kashmir has resulted in a considerable addition to the revenue, and is creditable to the officer lent to the Durbar.

APPENDICES.

APPEN

Summary of the Revenue and Expenditure of the

Budget Heads.	Bengal Presidency (British										
	Imperial.	Bengal.	North-Western Provinces and Oudh.	Punjab.	Central Provinces.	Burma (Lower).	Burma (Upper).	Assam.	Coorg.	Ajmere.	Baluchistan.
REVENUE.	R	R	R	R	R	R	R	R	R	R	R
I.—Timber and other produce removed from the forests by Government agency.	...	26,080	6,35,790	5,23,490	57,730	22,10,710	12,050	7,610	1,30,300	...	5,310
II.—Timber and other produce removed from the forests by consumers or purchasers.	4,960	6,68,670	9,49,330	2,45,470	11,29,560	9,22,770	19,94,310	3,00,590	49,400	14,480	1,310
III.—Drift and waif wood and confiscated forest-produce.	...	10,860	18,990	20,710	3,560	96,050	35,330	3,090	...	...	...
IV.—Revenue from forests not managed by Government.	...	...	6,770	3,520	...	3,05,020	...	29,550	...	...	12,040
V.—Miscellaneous . . .	280	39,270	41,660	19,440	40,000	48,820	34,940	41,990	980	410	370
Total Revenue .	5,240	7,44,880	16,52,540	8,12,630	12,30,850	35,83,370	20,76,630	3,82,830	1,80,680	14,890	19,030
EXPENDITURE.											
A.—Conservancy and Works.											
I.—Timber and other produce removed from the forests by Government agency.	...	10,600	2,76,710	2,15,880	25,230	6,74,190	6,490	6,540	15,330	...	1,160
II.—Timber and other produce removed from the forests by consumers or purchasers.	...	46,640	37,970	1,730	1,40,990	17,210	6,670	14,360	...	...	10
III.—Drift and waif wood and confiscated forest-produce.	...	2,830	8,770	5,520	50	49,010	17,040	440	...	...	...
IV.—Revenue from forests not managed by Government.	...	...	4,450	...	...	13,340	...	730	...	...	1,820
V.—Rent of leased forests, and payments to shareholders in forests managed by Government.	...	...	12,060	57,380	130	...	...	...	...	...	...
VI.—Live-stock, stores, tools and plant.	...	17,840	23,140	3,560	12,160	40,010	46,460	13,460	1,350	130	490
VII.—Communications and buildings.	...	30,440	1,04,750	13,070	17,680	13,700	19,820	13,900	2,750	— 320	6,070
VIII.—Demarcation, improvement and extension of forests.	...	22,340	1,01,860	59,630	1,92,260	1,96,100	32,630	64,140	18,720	1,500	23,930
IX.—Miscellaneous . . .	...	2,660	12,840	2,010	6,740	5,820	2,700	3,240	270	...	10
Total A.—Conservancy and Works	...	1,33,350	5,82,550	3,58,780	3,95,240	10,09,380	1,31,810	1,16,810	38,420	1,950	33,490
B.—Establishments.											
I.—Salaries	(a) 78,570	2,07,950	2,88,960	2,40,290	4,05,290	3,00,690	2,58,730	1,19,740	28,600	10,860	18,330
II.—Travelling allowances .	...	31,090	36,700	36,000	23,010	44,060	42,870	20,820	4,490	1,560	2,740
III.—Contingencies . . .	240	9,220	20,330	21,200	27,860	9,120	8,340	6,700	1,580	630	1,060
Total B.—Establishments .	78,810	2,48,260	3,45,990	2,97,490	4,56,160	3,53,870	3,09,940	1,47,260	34,670	13,050	22,130
Charges in England. .	17,770	...	...	...	...	...	...	...	...	...	...
Exchange on England .	10,690	...	...	...	...	...	...	...	...	...	...
Grand Total of Expenditure .	1,07,270	3,81,610	9,28,540	6,56,270	8,51,400	13,63,250	4,41,750	2,64,070	73,090	15,000	55,620
Surplus .	...	3,63,270	7,24,000	1,56,360	3,79,450	22,20,120	16,34,880	1,18,760	1,07,590	...	...
Deficit .	1,02,030	...	...	...	...	...	...	...	...	110	36,590

(a) Salary of the Inspector General and Assistant Inspector

DIX I.

Forest Department in India for the year 1892-93.

TERRITORIES). Andamans.	Forest School	Forest Surveys (Imperial).	Total Bengal Presidency (British Territories).	Madras.	Bombay.	Total British Provinces.	Berar.	Forest Surveys (Berar).	Grand Total.	BUDGET HEADS.
R	R	R	R	R	R	R	R	R	R	REVENUE.
3,57,340	...	...	39,66,410	3,30,480	16,10,620	59,07,510	...	...	59,07,510	I.—Timber and other produce removed from the forests by Government agency.
2,580	...	...	62,83,430	11,81,090	15,37,080	90,01,600	4,28,010	...	94,29,610	II.—Timber and other produce removed from the forests by consumers or purchasers.
60	...	...	1,88,650	10,080	10,790	2,09,520	1,120	...	2,10,640	III.—Drift and waif wood and confiscated forest-produce.
...	...	...	3,56,900	...	28,790	3,85,690	...	...	3,85,690	IV.—Revenue from forests not managed by Government.
510	1,980	520	2,71,170	55,560	82,270	4,09,000	1,890	...	4,10,890	V.—Miscellaneous.
3,60,490	1,980	520	1,10,66,560	15,77,210	32,69,550	1,59,13,320	4,31,020	...	1,63,44,340	Total Revenue.
										EXPENDITURE.
										A.—CONSERVANCY AND WORKS.
1,48,720	...	...	13,80,850	1,51,670	6,51,600	21,84,120	...	...	21,84,120	I.—Timber and other produce removed from the forests by Government agency.
220	...	...	2,65,800	73,270	40,300	3,79,370	30,060	...	4,09,430	II.—Timber and other produce removed from the forests by consumers or purchasers.
...	...	...	83,660	2,300	170	86,130	...	...	86,130	III.—Drift and waif wood and confiscated forest-produce.
...	...	...	20,340	...	...	20,340	...	...	20,340	IV.—Revenue from forests not managed by Government.
...	...	...	69,570	18,890	31,820	1,20,280	17,120	...	1,37,400	V.—Rent of leased forests and payments to shareholders in forests managed by Government.
30,280	2,100	2,110	1,93,090	25,480	17,950	2,36,520	8,580	...	2,45,100	VI.—Live-stock, stores, tools and plant.
20,050	...	...	2,42,550	81,530	14,330	3,38,410	40,140	...	3,78,550	VII.—Communications and buildings.
5,430	...	3,970	7,22,510	3,03,750	2,34,020	12,60,280	15,620	...	12,75,900	VIII—Demarcation, improvement and extension of forests.
5,670	4,100	320	46,380	21,420	26,620	94,420	1,170	...	95,590	IX.—Miscellaneous.
2,10,370	6,200	6,400	30,24,750	6,78,310	10,16,810	47,19,870	1,12,690	...	48,32,560	Total A.—Conservancy and Works.
										B.—ESTABLISHMENTS.
17,990	38,190	11,730	20,25,920	4,96,050	7,43,360 / 3,900	32,69,230	93,480	...	33,62,710	I.—Salaries.
2,290	3,540	20	2,49,190	1,10,440	1,04,500	4,64,130	14,260	...	4,78,390	II.—Travelling allowances.
560	2,470	4,010	1,13,320	45,590	36,400	1,95,310	8,800	...	2,04,110	III.—Contingencies.
20,840	44,200	15,760	23,88,430	6,52,080	8,88,160	39,28,670	1,16,540	...	40,45,210	Total B.—Establishments.
...	...	...	17,770	...	...	17,770	...	...	17,770	Charges in England.
...	...	...	10,690	...	...	10,690	...	...	10,690	Exchange on England.
2,31,210	50,400	22,160	54,41,640	13,30,390	19,04,970	86,77,000	2,29,230	...	89,06,230	Grand Total of Expenditure.
1,29,280	...	...	56,24,920	2,46,820	13,64,580	72,36,320	2,01,790	...	74,38,110	SURPLUS.
...	48,420	21,640	...	...	...	...	...	...	...	DEFICIT.

G eneral of Forests, and his Establishments and Contingencies.

STATEMENT II.*

Revenue, Expenditure, and Surplus of the Forest Department throughout India during the 25 years from 1868-69 to 1892-93

REVENUE.

Provinces.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.	1890-91.	1891-92.	1892-93.
	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Imperial†	1,159	1,436	3,107	2,334	2,771	1,225	1,144	1,465	2,490	1,36,772	16,716	17,214	18,887	27,407	30,732	32,907	26,574	14,708	4,186	4,847	4,017	4,759	6,370	6,688	5,210
Bengal	70,715	2,44,657	1,03,249	1,44,719	1,49,852	1,79,366	1,85,932	1,98,274	2,22,401	4,26,228	4,16,027	4,49,524	5,61,340	6,33,734	6,93,959	6,94,334	5,71,152	5,97,432	6,53,634	6,57,794	6,76,907	7,68,718	7,27,392	7,89,553	7,44,880
North-Western Provinces and Oudh	7,85,210	8,32,945	4,24,257	11,70,900	19,39,115	19,32,677	13,63,358	12,64,356	11,50,671	12,03,108	11,26,755	10,39,966	9,42,228	10,66,094	10,13,403	16,11,383	15,72,319	14,61,495	15,73,556	12,47,454	14,62,802	17,14,159	16,37,879	17,31,514	16,52,540
Punjab	3,44,882	3,94,129	9,47,236	7,10,216	6,52,995	7,32,539	8,34,874	9,09,831	5,98,754	6,83,711	5,00,619	6,49,819	6,71,678	6,88,308	7,66,709	9,10,177	7,49,352	8,50,419	11,27,277	7,86,936	10,45,768	9,21,713	8,34,370	10,20,074	8,12,630
Central Provinces	3,50,536	4,16,020	6,58,120	5,57,128	4,81,673	5,63,367	6,60,938	7,26,176	6,61,326	6,83,910	8,52,862	10,06,724	8,50,139	11,72,884	9,77,647	9,94,769	10,27,202	10,36,894	9,57,410	10,93,369	11,80,405	11,56,181	12,13,461	13,59,900	12,30,850
Burma (Lower)	8,17,599	9,84,774	8,18,124	7,72,400	8,27,569	10,68,621	10,74,802	17,79,020	15,51,408	16,03,082	11,37,562	11,80,190	15,16,613	22,31,804	25,03,896	25,09,275	16,70,982	20,23,859	19,96,667	22,18,897	26,09,305	31,34,716	26,77,671	28,58,114	35,83,370
Burma (Upper)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,08,074	2,96,876	15,79,928	18,06,070	16,44,297	13,27,300	20,76,630
Assam	...	...	...	...	...	...	65,949	61,870	81,568	1,34,326	1,61,779	1,64,335	1,68,997	1,66,054	2,48,605	2,11,445	1,80,414	1,96,656	2,12,011	2,67,312	8,03,882	3,79,498	3,26,793	3,36,129	3,82,830
Coorg	98,496	1,08,135	72,144	92,466	84,425	1,10,284	58,015	1,07,460	75,927	1,01,015	52,020	1,01,786	87,857	1,00,364	1,38,022	87,822	1,13,233	89,386	99,291	1,27,028	1,36,183	92,753	1,35,561	1,82,897	1,80,680
Ajmere	...	...	...	...	21	304	202	410	905	3,002	1,241	1,861	1,124	4,065	7,120	8,196	10,456	9,697	11,274	14,293	13,574	11,592	15,266	19,799	14,890
Forest Surveys (Imperial)	...	...	...	...	...	...	...	21	...	...	63	38	272	...	348	36	234	202	241	40	315	220	2,104	257	520
Forest School	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	73	273	415	777	449	1,237	1,184	1,788	1,980
Andamans	5,071	3,036	7,373	5,880	6,862	4,184	5,516	5,363	4,679	1,301	5,564	2,437	27,734	48,407	70,858	24,762	12,213	23,944	31,870	1,04,062	1,06,075	1,62,195	1,58,326	2,72,338	3,60,490
Total	24,73,668	29,85,132	30,33,610	34,56,043	41,45,286	45,97,567	42,50,730	50,54,246	43,50,129	49,76,455	42,71,208	46,13,894	48,46,869	61,39,121	64,51,305	70,85,108	50,44,204	63,04,965	67,77,906	68,19,685	91,19,610	1,01,58,811	93,80,674	99,06,351	1,10,47,530
Madras	5,29,185	6,97,699	5,33,412	5,76,261	5,95,188	6,13,653	5,14,401	6,77,873	5,92,573	5,50,310	6,06,788	6,26,168	7,36,880	8,06,908	9,06,442	9,53,704	11,66,916	11,98,650	12,46,911	13,74,920	15,15,006	15,57,627	17,95,403	16,94,216	15,77,210
Bombay	12,13,483	12,35,257	11,68,401	11,50,215	11,46,405	11,88,089	12,24,051	12,48,672	12,26,658	12,61,528	11,81,894	15,24,712	15,22,807	18,28,117	20,90,353	25,03,100	27,74,842	33,66,286	30,32,676	30,32,577	28,50,190	31,37,696	32,88,220	32,84,649	32,69,550
Total (British India)	42,16,336	49,18,088	47,35,422	51,82,519	58,86,879	63,99,309	59,89,182	69,80,791	61,69,360	67,88,293	60,59,890	67,64,774	71,06,556	87,74,146	94,48,100	1,05,41,912	98,85,962	1,08,69,901	1,10,57,493	1,12,27,182	1,34,84,806	1,48,49,134	1,44,64,302	1,48,85,216	1,58,94,290
Berar	84,557	1,80,397	1,77,329	1,55,543	2,56,563	2,63,256	2,60,674	2,32,782	2,53,072	2,79,236	2,88,704	3,07,500	2,66,556	2,33,511	2,92,014	3,08,218	2,97,185	3,19,851	3,26,261	4,06,447	4,07,977	4,40,541	4,87,109	5,11,185	4,31,020
Forest Surveys (Berar)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	934	631	651	596	...	...	...	...	...
Baluchistan	...	...	...	...	...	...	...	...	...	...	...	...	14,376	18,616	5,039	4,752	6,089	14,962	14,081	14,063	5,668	13,897	15,724	20,609	19,030
Grand Total	43,00,893	50,98,485	49,12,752	53,38,062	61,43,442	66,62,565	62,49,856	72,13,573	64,22,432	70,67,529	63,48,594	70,72,274	73,87,488	90,26,273	97,45,153	1,08,54,882	1,01,90,176	1,12,05,345	1,13,98,486	1,16,48,288	1,38,98,451	1,53,03,572	1,49,67,135	1,54,17,010	1,63,44,340

* The figures in this statement have been revised by the Comptroller and Auditor General.
† Includes certain home receipts and undistributable and petty local items.

STATEMENT II —*continued.*

EXPENDITURE.

Provinces.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.	188[illegible]-90.	1890-91.	1891-92.	1892-93.
	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Imperial*	22,007	54,106	51,423	66,580	67,150	79,216	81,210	48,239	44,004	98,689	63,956	73,810	65,291	77,635	87,263	98,266	96,306	88,245	86,299	78,626	86,199	81,311	85,414	65,788	1,07,270
Bengal	1,15,988	1,17,899	86,479	1,10,989	1,00,777	1,39,274	1,01,361	1,42,676	2,14,497	2,62,913	3,38,675	2,75,748	3,35,381	3,94,612	3,82,183	3,87,813	4,11,915	3,70,399	4,22,781	3,90,368	3,76,270	3,98,150	4,14,004	4,22,930	3,81,610
North-Western Provinces and Oudh	5,01,021	5,29,422	8,10,073	11,10,071	11,74,686	11,90,794	10,61,302	7,36,979	8,61,352	7,28,926	8,09,977	7,16,594	6,79,574	9,16,212	8,39,025	10,41,885	10,20,101	9,74,519	9,19,580	8,30,748	8,44,544	9,63,151	9,19,19	9,58,211	9,28,540
Punjab	3,17,628	7,41,432	11,95,655	7,07,619	8,90,363	6,11,556	6,58,983	5,56,911	5,25,659	5,20,631	5,23,554	4,80,676	4,95,368	5,16,269	5,60,750	6,53,146	5,58,070	6,75,483	7,16,510	6,77,912	5,93,895	6,45,855	6,53,041	6,40,275	6,56,270
Central Provinces	3,19,126	4,74,930	3,17,928	2,31,633	2,50,578	2,85,839	2,94,449	3,73,327	2,90,295	3,22,034	3,93,758	5,22,574	4,95,512	4,97,013	4,12,247	4,36,058	4,95,821	4,45,432	4,99,293	5,52,939	6,68,697	6,96,445	7,35,554	8,03,915	8,51,400
Burma (Lower)	4,24,333	4,22,106	4,00,851	3,79,217	3,36,759	4,75,304	6,63,547	8,15,659	10,05,554	8,58,231	7,18,402	7,53,490	7,12,568	11,50,224	12,28,955	12,17,824	12,12,233	11,50,952	10,75,830	10,32,694	12,31,944	13,32,844	10,86,474	13,25,121	13,63,250
Burma (Upper)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2,188	1,21,152	7,85,129	2,73,800	3,02,315	3,73,859	4,41,750
Assam	...	...	...	...	...	...	60,367	63,397	90,520	1,01,153	1,28,028	1,32,825	1,42,725	1,65,361	1,71,823	1,99,562	1,97,699	2,11,494	2,12,287	2,26,892	2,09,905	2,57,129	2,83,852	2,67,525	2,64,070
Coorg	17,949	23,064	24,747	70,178	29,478	45,952	37,999	40,168	33,692	36,268	34,829	55,165	56,487	59,796	64,770	75,023	76,951	65,690	74,088	72,629	80,175	72,420	65,818	86,860	73,090
Ajmere	...	...	...	...	13,056	17,932	15,261	27,346	22,460	14,926	13,445	13,750	12,423	13,954	11,284	14,574	16,316	16,469	20,744	18,897	15,676	12,701	12,720	12,986	15,000
Forest Surveys (Imperial)	...	...	...	...	...	59,556	78,090	58,930	58,929	60,165	60,325	46,878	40,335	42,489	41,595	30,940	19,823	19,180	28,348	32,868	22,164	21,182	28,324	26,882	22,160
Forest School	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	22,568	24,239	30,831	33,129	32,961	29,646	35,191	44,247	50,400
Andamans	...	150	...	1,651	1,898	...	...	...	1,307	1,096	...	7,177	2,160	2,306	1,840	12,161	22,760	37,035	25,769	62,679	57,295	94,975	1,30,052	1,79,909	2,31,210
Total	17,28,902	23,73,109	28,87,156	26,79,888	28,64,728	29,05,523	30,52,589	28,63,632	31,48,279	30,04,442	30,82,949	30,72,691	30,37,324	38,35,871	38,01,740	41,67,252	41,50,563	40,79,137	41,14,548	41,31,532	50,04,844	48,79,615	47,47,954	52,09,608	53,86,020
Madras	4,01,617	4,21,316	4,47,267	3,91,921	5,48,746	4,74,920	5,95,941	5,92,039	6,35,360	5,65,624	4,95,914	5,48,527	5,19,270	6,03,419	6,45,352	7,86,733	8,96,505	9,37,972	11,53,122	11,29,212	12,20,794	11,61,237	12,46,913	13,21,254	13,30,380
Bombay	6,31,226	5,56,015	6,39,759	5,97,831	7,25,037	7,21,594	8,36,675	7,94,141	8,38,979	8,77,716	10,04,923	10,76,989	11,67,347	11,69,181	12,78,770	15,64,172	17,78,723	18,39,461	19,52,910	19,44,005	16,93,962	17,70,691	18,69,897	19,31,457	19,04,970
Total (British India)	27,61,745	33,50,440	39,74,182	36,67,640	41,38,505	41,02,037	44,85,205	42,49,812	46,22,818	44,47,782	45,83,786	46,98,207	47,23,941	56,08,471	57,25,862	65,18,157	68,25,791	68,56,570	72,20,580	72,04,750	79,19,600	78,11,543	78,64,754	84,65,319	86,21,380
Berar	34,105	81,569	81,972	1,00,829	83,631	86,350	91,389	91,449	94,652	1,09,868	1,07,350	1,10,506	1,28,968	1,52,985	1,55,054	1,56,779	1,52,649	1,59,282	1,71,704	1,83,765	1,70,212	1,76,549	1,68,921	1,98,366	2,29,230
Forest Surveys (Berar)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15,043	34,804	42,940	45,472	42,038	23,955	6,469	...	...	...
Baluchistan	...	...	...	...	...	...	...	...	...	...	...	...	16,416	17,682	11,982	16,911	13,296	15,799	17,836	17,752	15,994	17,962	29,450	30,397	55,620
Grand Total	27,95,850	34,32,009	40,56,154	37,68,469	42,22,136	41,88,387	45,76,594	43,41,311	47,17,470	45,57,750	46,91,136	48,08,713	48,69,325	57,79,138	58,92,878	67,06,890	70,26,510	70,71,551	74,35,892	74,48,305	81,29,761	80,12,518	80,63,125	86,94,182	89,06,230

* Includes pay of Inspector General of Forests, certain home charges, and undistributable and petty local items.

STATEMENT II —*concluded.*

SURPLUS.

Provinces.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.	1890-91.	1891-92.	1892-93.
	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Imperial *	−31,848	52,670	−48,316	−64,196	−64,379	−77,961	−80,066	−46,774	−41,514	38,673	−47,240	−56,596	−46,404	−50,228	−56,536	−65,359	−69,732	−73,537	−82,113	−73,779	−82,182	−76,552	−79,044	−59,100	−1,02,030
Bengal	−45,218	1,26,758	16,770	33,730	49,075	40,092	84,571	55,598	7,904	1,63,315	77,352	1,73,776	2,25,959	2,39,122	3,11,776	3,06,521	1,59,237	2,27,033	2,30,853	2,67,426	3,00,637	3,70,568	3,13,388	3,66,623	3,63,270
North-Western Provinces and Oudh	2,84,189	3,03,523	−3,85,816	60,829	7,64,449	7,41,883	3,02,056	5,27,377	2,89,309	4,74,182	3,16,778	3,23,372	2,62,654	1,49,882	1,74,378	5,69,498	5,52,218	4,86,976	6,53,976	4,16,706	6,18,258	7,51,008	7,18,681	7,73,303	7,24,000
Punjab	27,248	−3,47,303	2,48,419	2,597	−2,37,374	1,20,983	1,75,891	3,52,920	73,095	1,63,083	−22,935	1,69,143	1,76,310	1,72,039	2,05,959	2,57,031	1,91,282	1,74,936	4,10,767	1,09,024	4,51,883	2,75,858	1,81,329	3,79,799	1,56,360
Central Provinces	31,410	−58,910	3,40,192	3,25,495	2,31,095	2,82,428	3,66,489	3,52,849	3,71,031	3,61,876	4,59,104	4,84,150	3,54,627	6,75,871	5,65,400	5,58,711	5,31,381	5,91,462	4,58,117	5,40,430	5,11,708	4,59,736	4,77,907	5,55,985	3,79,450
Burma (Lower)	3,93,266	5,62,668	4,17,273	3,93,183	4,90,810	5,93,317	4,11,255	9,63,361	5,45,854	7,44,851	4,19,160	4,26,700	8,04,045	10,81,580	12,74,941	12,91,451	4,58,749	8,72,907	9,22,837	11,86,203	13,77,361	18,01,872	15,91,197	15,32,993	22,20,120
Burma (Upper)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,05,886	1,75,724	7,94,799	15,32,270	13,41,982	9,53,441	16,34,880
Assam	...	...	...	...	...	...	5,582	−1,527	−8,952	33,173	35,751	31,506	26,272	693	67,782	11,883	−17,285	−14,838	−276	40,420	93,977	1,22,369	42,941	68,604	1,18,760
Coorg	80,648	75,071	47,397	22,288	54,946	64,332	20,016	67,292	42,285	64,747	17,191	46,621	31,370	40,568	73,252	12,799	36,282	23,696	25,203	54,399	56,008	20,333	69,743	96,037	1,07,590
Ajmere	...	...	...	...	−13,030	−17,628	−15,079	−26,936	−21,555	−11,924	−12,204	−11,889	−11,299	−9,889	−4,158	−6,376	−5,860	−6,772	−9,470	−4,604	−2,102	−1,109	2,546	813	−110
Forest Surveys (Imperial)	...	...	...	...	...	59,556	−78,090	−58,909	−58,929	−60,165	−60,262	−46,840	−40,063	−42,489	−41,247	−30,904	−19,589	−18,978	−28,107	−32,828	−21,849	−20,968	−22,220	−26,625	−21,640
Forest School	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	−22,495	−23,966	−30,416	−32,352	−32,512	−28,409	−34,007	−42,559	−48,420
Andamans	5,071	2,886	7,373	4,229	4,966	4,181	5,516	5,363	3,372	205	5,564	−4,740	25,574	46,101	69,018	12,601	−547	−13,091	6,101	41,383	48,780	67,220	28,274	92,429	1,29,280
Total	7,44,766	6,12,023	1,46,454	7,78,155	12,80,558	16,92,044	11,98,141	21,90,614	12,01,850	19,72,013	11,88,259	15,35,203	18,09,045	23,03,250	26,49,565	29,17,856	17,93,641	22,25,828	26,63,358	26,88,152	41,14,766	52,74,196	46,32,720	46,96,743	56,61,510
Madras	1,27,568	2,76,333	86,145	1,84,340	46,442	1,38,733	−81,540	85,834	−42,987	−15,314	1,10,874	76,641	2,17,610	2,03,489	2,61,090	1,66,971	2,70,411	2,60,678	93,789	2,45,708	2,94,212	3,96,390	5,48,495	3,69,962	2,46,820
Bombay	5,82,257	6,79,242	5,28,642	5,52,384	4,21,374	4,66,495	3,87,376	4,54,531	3,87,679	3,83,812	1,76,971	4,47,723	3,55,460	6,58,936	8,11,583	9,38,928	9,96,119	15,26,825	10,79,766	10,88,572	11,56,228	13,67,005	14,18,333	13,53,192	13,64,580
Total (British India)	44,54,591	15,67,648	7,61,241	15,14,879	17,48,374	22,97,272	15,03,977	27,30,979	15,46,542	23,40,511	14,76,104	20,59,567	28,82,115	31,65,675	37,22,238	40,23,755	30,60,171	40,13,331	23,36,913	40,22,432	55,65,206	70,37,591	65,99,548	64,19,897	72,72,910
Berar	50,452	98,828	95,357	54,714	1,72,932	1,76,906	1,69,285	1,41,282	1,58,420	1,69,268	1,81,254	1,96,994	1,37,588	80,526	1,36,960	1,51,439	1,44,536	1,36,609	1,54,552	2,22,682	2,37,765	2,63,992	3,18,188	3,12,819	2,01,790
Forest Surveys (Berar)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	−15,043	−33,870	−42,309	−44,821	−41,502	−23,955	−6,464	...	...	...
Baluchistan	...	...	...	...	...	...	...	...	...	...	...	...	−2,040	934	−6,923	−12,159	−7,177	−837	−3,755	−3,690	−10,326	−4,065	−13,726	−9,888	−36,590
Grand Total	15,05,043	16,66,476	8,56,598	15,69,593	19,21,306	24,74,178	16,73,262	28,72,262	17,04,932	25,09,779	16,57,458	22,56,561	25,17,663	32,47,135	38,52,275	41,47,992	31,63,660	41,30,794	39,42,894	41,99,922	57,68,690	72,91,054	69,04,010	67,22,828	74,38,110

*Includes pay of Inspector General of Forests, certain home charges, and undistributable and petty local items.

G. I. C. P. O.—No. 411 R. & A.—9-11-94.—200.—C P.